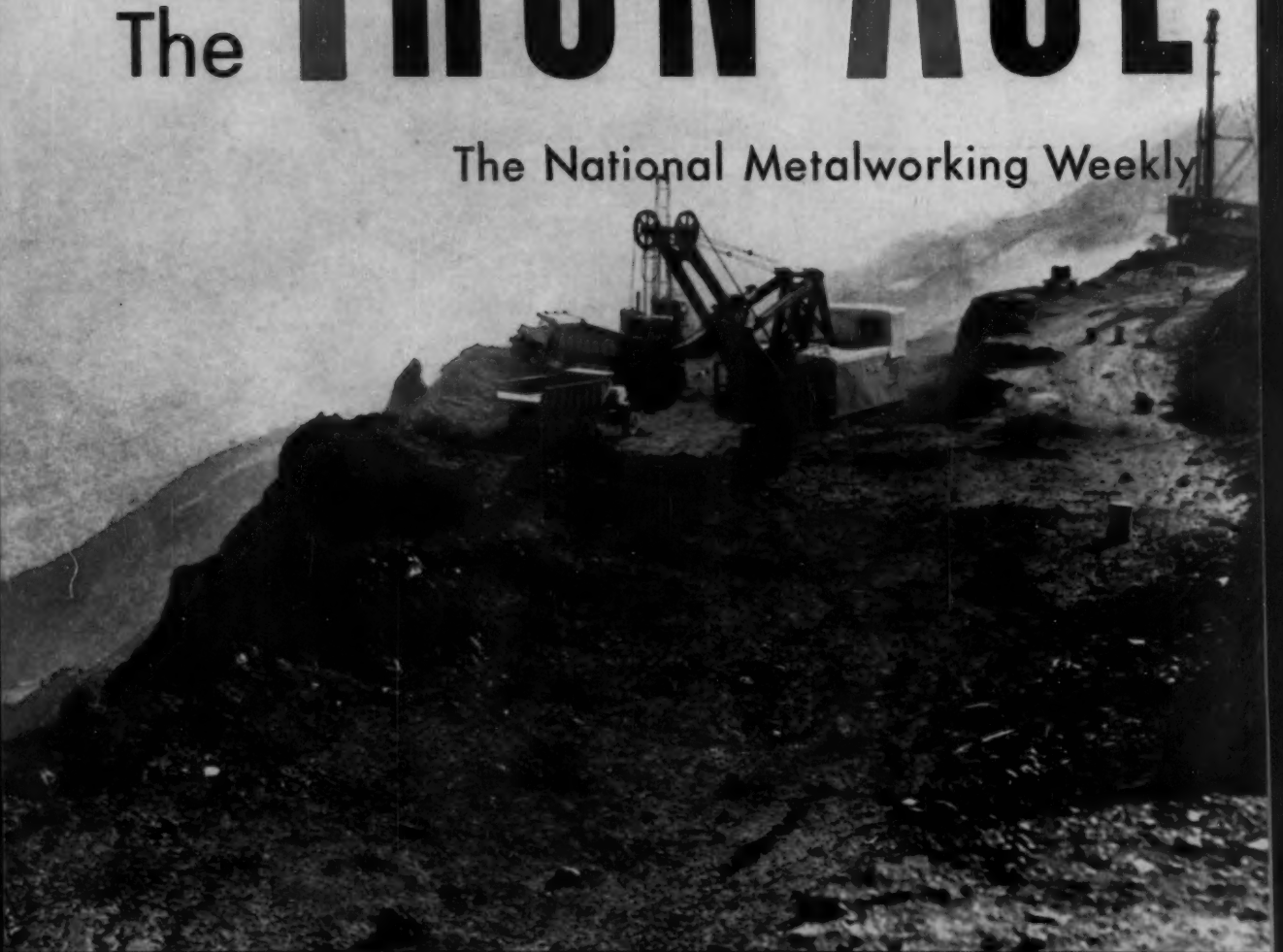


November 29, 1956

The **IRON AGE**

The National Metalworking Weekly



Why U. S. Looks To Imported Iron Ores P. 75

How To Cut Employee Turnover P. 59

Take Six Steps To Better Brazing Practice P. 80

Digest of the Week P - 2

"Trade Names You Can Trust!"

No matter when or where they are purchased, any length of *genuine* Hoskins Chromel-P wire can be used with any length of *genuine* Alumel wire to form a thermocouple which will operate within the close limits specified by Hoskins' Accuracy Guarantee: $\pm 4^{\circ}\text{F.}$ from 32° to 530°F. , and $\pm \frac{3}{4}\%$ from 531° to 2300°F.



HOSKINS Chromel-Alumel

THERMOCOUPLE ALLOYS

CONSIDER for a moment the significance of the statement made above and what it means to users of Hoskins Chromel-Alumel thermocouple alloys the world over. For example, take "The Case of the Ageless Alumel" . . .

Not long ago, an industrial concern in Japan "discovered" 265 pounds of 8-gauge wire hidden away in a remote corner of their plant. Its Inspection Tag, still intact, identified it as being Hoskins Alumel that had been purchased over 20 years ago. How it had escaped being used during all those years no one knew. Inasmuch as it was still in good usable condition, however, the company wrote to inquire if it would be practical . . . or indeed even possible to have a similar quantity of 8-gauge Chromel-P wire specially processed so that its millivoltage would match that of the 1933-vintage Alumel. Imagine their surprise when they were advised that all Chromel-P alloy is specially processed by Hoskins to a uniform standard of quality, and that . . . "regardless of when produced or where purchased, any length of *genuine* Chromel-P wire can be joined to any length of

genuine Alumel to form a thermocouple which will register true temperature-emf values within the close specified limits of Hoskins Accuracy Guarantee."

No wonder, then, that Chromel-Alumel thermocouples are the world's basic standard of accuracy for the measurement of high temperatures. No wonder that the words "Chromel-Alumel" are recognized as . . . "trade names you can trust!"

If you use thermocouples, this new manual is meant for you! It contains complete specifications on Chromel-Alumel alloys, lists temperature-millivolt equivalents, explains standardization procedures, gives much useful application data. And it's yours for the asking without obligation. Send for your free copy today!



Chromel-Alumel thermocouple alloys are produced exclusively by

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Skagit Yarder-Loader, familiar sight around Northwest logging operations, moves ponderous logs with ease and agility because of rugged yet light-weight boom of Mayari R.

"Materials-handling" in the great North woods

In the sprawling timberlands of the Pacific Northwest they fell the raw materials for lumber, plywood, pulp and matches. Pulling the giant logs to a landing and loading them on big trucks is the job of mobile loggers designed and built by Skagit Steel and Iron Works in Sedro Woolley, Washington.

The logs are heavy and the going's rough, so these mobile loggers must be rugged yet highly maneuverable. To cut down unnecessary weight, Skagit builds the lifting booms from angles and channels of Mayari R low-alloy, high-strength steel. Because Mayari R has a substantially higher yield point than carbon steel, an amply strong boom can be built with lighter members.

Skagit shop men find that they can weld Mayari R as readily as regular carbon steels, with the same general procedures. And Mayari R has from 5 to 6 times greater resistance to atmospheric corrosion, a distinct advantage under damp forest conditions.

All the significant properties of Mayari R, along with dozens of case histories and application photographs, are interestingly set forth in Catalog 353. If you would like to have a copy just get in touch with the Bethlehem district sales office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corp. Export Distributor: Bethlehem Steel Export Corp.

Mayari R... High-Strength, Corrosion-Resisting Steel



Nov. 29, 1956—Vol. 178, No. 22

The IRON AGE

Digest of the Week in Metalworking

Starred items are digested at right.

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THE IRON AGE, published every Thursday by CHILTON CO., Chestnut & 56th Sts., Philadelphia 39, Pa. Entered as second class matter, Nov. 8, 1932, at the Post Office at Philadelphia under the act of March 3, 1879. Price to the metalworking industries only, or to people actively engaged therein, \$5 for 1 year, \$8 for 3 years in the United States, its territories and Canada. All others \$15 for 1 year; other Western Hemisphere countries, \$15; other Foreign Countries, \$25 per year. Single copies, 50¢. Annual Review Issue, \$2.00. Cables: "Ironage," N. Y.

Address mail to The IRON AGE
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NEWS DEVELOPMENTS

ARE WAREHOUSES STEEL'S NO. 1 CUSTOMER?

P. 35

Nine months' totals put warehouses in lead over automotive. But late surge in auto buying could wipe out edge. Shipments for year should exceed 14 million tons. Warehouses also have many growth problems.

BASIC INDUSTRY MOVES INTO THE SOUTH

P. 38

Industrial employment in the South has risen by more than 200,000 since 1947. Area's potential is still untapped. Labor and markets are available for basic industry.

METAL TOYS DOMINATE THE MARKET

P. 42

As Santa prepares to make his annual visit, metals are still king in the toy market. They account for 30 pct of total sales. Plastics are in second place. Retail sales run \$1.4 billion, up 12 pct over 1955.

RECREATION PLANS COST \$800 MILLION A YEAR

P. 43

Employees, however, have a share in financing, as well as organizing pro-



(Continental Steel Corp. photo)

grams. Trend is toward broader, more diverse schedules. There's greater emphasis on family events, more interdepartmental competing.



WHERE WILL the ore we'll use in 1975 come from? With need for imports up, world iron ore survey on page 75 by Editor-in-Chief Tom Campbell reports almost 20 pct will come that year from South American stocks like this. Here high grade ore is loaded at U. S. Steel's Orinoco Mining Co. installation in Venezuela.

HOW ILLINOIS PLANS TO LURE INDUSTRY P. 46

State and cities plan "Operation Pin-point" to attract new industry. Each city's available facilities are listed. Prospective buyers are protected from possible land booms. State survey will show available sites, population, manufacturing space. Plan may be first to use cooperative action by state and municipal governments.

FEATURE ARTICLES

STEEL DEMAND CALLS FOR HIGHER IRON ORE IMPORTS P. 75

Comprehensive report on the world iron ore picture by Tom Campbell, IRON AGE Editor-in-Chief, points out U. S. will supply only 59 pct of its ore needs by 1975. Consumption, estimated conservatively, by that period may be 169 million gross tons of iron ore. American, Canadian and South American policies seen setting, or changing, usage patterns.

TAKE SIX STEPS FOR BETTER BRAZING P. 80

Silver brazing can produce strong, tight, low-cost joints of high quality. But for consistently good results six elements of proper practice must be observed. Watching such factors as joint spacing, pre- and post-braze cleaning, fluxing and jigging can improve quality immeasurably.

COMPRESSED AIR GIVES POWER FOR PROCESSING P. 82

Gather in air, squeeze it sufficiently, and it's ideal for energizing half a hundred industrial operations. High-speed tools, air cylinders, riveters, air blowoffs, air chucking are typical. One large plant uses 11 compressors to supply air at 100, 250 and 350 psi pressures. Several ingenious chucking arrangements, vibration operations find extensive use.

CONTROL FLATNESS OF HIGH STRENGTH PH SHEET P. 84

One way of controlling sheet distortion in heat treatment involves several stretch-flattening operations. Result is PH sheet steel to "bonding flatness." A possible alternate calls only for a weighted rig of plywood and metal channel. It's important, as demand for precipitation hardening steels continues to rise.

HANDLE CHIPS EFFICIENTLY FOR GREATER SHOP PROFITS P. 88

Many types of ingenious equipment help round out the complete chip-handling system, this last of 5-part series of articles points out. Besides the basics, equipment could include special conveyors, chip washers and driers, and briquetting machines. Cleaning and briquetting scrap boosts its value.

MARKETS AND PRICES

NEW LIFE FOR HIGH-STRENGTH STEEL SALES P. 37

Fresh markets give new importance to high-strength, low-alloy steels. Established markets such as rail cars also boom. Mills are placing greater emphasis on these grades as production continues to grow. Output this year should hit 900,000 tons. Shipments running about 15 pct higher.

CURTAIN WALLS GET ARCHITECTS' SUPPORT P. 40

An estimated 50 pct of all industrial and commercial buildings now under construction are getting metal curtain walls. Architects go for its light weight, space-saving and fast erection features. Building codes present obstacles in some areas.

NATION'S POWER DEMANDS NEED MORE ENGINES P. 44

Makers of internal combustion engines have a backlog that assures good business through 1957. U. S. Census of Manufactures shows a consolidation of makers, although dollar value of shipments increased. Fewer firms put out greater percentage.

1958 EDSEL TO FILL GAP IN FORD LINE P. 52

New model will allow Mercury owners to step up modestly yet stay in the Ford family. Edsel Div. aims to capture 3.5 pct of the total market in 1958, selling 200,000 cars. All tooling for '58 model has already been released.

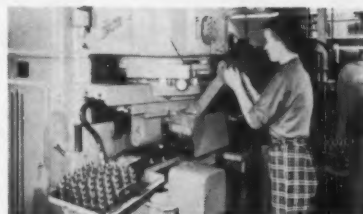
STEEL MILLS HEAD INTO PRODUCTION PROBLEMS P. 117

As steel demand moves toward a seasonal peak, steel mills are faced with production, maintenance, and holiday problems. It's doubtful that November pace can be maintained.

NEXT WEEK:

HOW AUTOMATIC LOADING LIFTS JOB PROFITS

With areas for saving on production costs getting tighter and tighter, the benefits of automatic loading devices for standard machines look more attractive. They pay off in many ways—but just how much and where? See next week's feature.



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If you machine carbon or alloy steels for production or maintenance applications—you should be able to make substantial savings by switching from a standard steel to a Ryerson *lead*ed steel.

We can tell you about customers who produce up to 50% more parts per machine hour, now that they have changed over to a leaded steel recommended by Ryerson. Others report tool life lengthened as much as 300% ... rejects reduced to all-time lows ... machine down-time slashed ... finishing processes eliminated.

The nation's largest stocks of leaded steels in a wide range of types and sizes are ready for quick shipment from Ryerson. (See listing below.) Each is the fastest machining steel of its type available anywhere. If you are not now using leaded steels, it will be worth your while to investigate the possibility of adapting one of them, or several, to your operations.

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Rycut 47 (Medium Carbon) ... Hot rolled, annealed rounds.

New Rycut 50 (Medium Carbon) ... Hot rolled and cold finished rounds in annealed condition, hot rolled rounds heat treated and stress relieved.

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Leaded 8647 ... Rounds, hot rolled, annealed.

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and the Engineering Index.



EDITORIAL

How About Our Own Fences?

♦ THERE IS NOTHING unusual about our running around the world trying to do good. Nor is it wrong to do everything we can to reduce chances of a world conflagration. That's our history.

It is natural for us to help out our allies across the seas. And it is no paradox for us to support the theory that people in Asia and Africa have basic rights—not to be denied by others.

It is just as natural for us to keep close tabs on the Butchers of Moscow. What they do is important to everyone on Main Street. We can't afford to be hoodwinked by the Reds.

Just the same, while we are doing all this we have some fences of our own. The Middle Eastern and Eastern European crises have caused some rifts in our relations with England and France. But they have brought us closer to Canada and South America.

That is very much to our advantage. Whether we know it or not, our government and some of our business people have been taking our friends to the north and south of us too much for granted.

This is a good time to point out that Canada and Venezuela together are shipping us almost 20 pct of our iron ore requirements this year; and it will be 35 pct in 1975. This, despite the fact that our taconite projects are growing by leaps and bounds.

Firm believers in free enterprise and sound taxing policies, these two countries have turned out to be the most practical friends we have had over recent years; in things other than ore.

Now that we are bound even closer together because of international tensions, it might be well to do a little fence-mending. No one likes to be taken for granted; no one likes the grand patronage attitude.

We can't tell what would happen if a world holocaust hit us suddenly. But we do know our friends to the north and south like us—and are on our side when the chips are down.

If we must embark on save-the-world campaigns, let us first keep our fences mended at home. That requires constant attention to our hemispheric friends as equals.

Constant friendship has its own rewards—and responsibilities!

Tom Campbell

EDITOR-IN-CHIEF



"The best parts? Sure, they're made of Stainless"

"As head of the Parts Department, I get a close-up view of this swing to Stainless Steel, and I think it's the smartest move the auto makers could make." This from the manager of the Parts Department of a large midwestern agency.

"They say if replacement parts are made of cheap materials, our business would be better. We haven't found that to be true. Just the opposite in fact. As parts are improved, our business, anyway, has continued to grow. Our customers realize the added value of Stainless Steel."

Stainless trim and accessories keep cars looking better longer, both inside and out. Stainless parts, like the rear fender plate, shown above, shrug off

flying stones, road salt, etc., without marking, discoloring, peeling or corroding.

Much of the Stainless Steel being used by leading automotive concerns comes from the mills of Sharon—where buyers know they can expect consistent quality plus the industry's finest finish.

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dear editor:

letters from readers

Industrial Health

Sir:

I cannot commend you too highly for your fine article, "Ten Commandments of Industrial Health" in your Nov. 8 issue. Dr. Harry J. Johnson certainly covers some very pertinent facts overlooked in our ever swiftly-moving day and generation. *H. T. Hansen, Asst. Purchasing Agent, Singmaster & Breyer, Inc., New York, N. Y.*

Sir:

Among the various interesting articles in your Nov. 8 issue I par-



Dr. Johnson gives health tips

ticularly enjoyed the one starting on p. 55 entitled "Ten Commandments of Industrial Health."

We are a subscriber to THE IRON AGE and it is circulated to management employees. Yet while this is true, I feel that copies of the article for my immediate staff would be beneficial. If it is not asking too much, I would appreciate your mailing us five copies. *C. F. Rechar, Supt. Chattanooga Works, The Western Union Telegraph Co., Chattanooga, Tenn.*

Copies are on the way.—Ed.

Predict Tempering Temperature

Sir:

The Oct. 25 issue, p. 61 mentions a new, fast method for predicting

tempering temperatures. Would you please refer us to the source of this information? *H. Chapman, Metallurgical Engineer, General Steel Wares Ltd., Toronto, Canada.*

The system for predicting tempering temperature is found in the ASM Preprint No. 14, 1956 entitled "Temperability of Steels" by Messrs. Jaffe and Gordon. It was published by the American Society for Metals, 7301 Euclid Ave., Cleveland 3, Ohio.—Ed.

Shadowless Light

Sir:

In your Oct. 4 Newsfront there are two items we would like to learn more about. We would appreciate your telling us where we should write for more information on the "treasure-chest electron tube" for extremely high frequencies and the "almost shadowless new light system of energized phosphor sandwiched panels." *G. F. Whiteman, Pres., Engineering Service Corp., Indianapolis, Ind.*

For further information about the "treasure-chest electron tube" write the Office of Information Services, Air Research and Development Command, United States Air Force, P. O. Box 1395, Baltimore 3, Md. For more on "shadowless light" write the Westinghouse Electric Corp., 3 Gateway Center, Pittsburgh 30, Pa.—Ed.

Marketing Guide

Sir:

I read with great interest your article concerning the use of the new Census of Manufactures and found it extremely informative.

I would appreciate very much your sending to me two or three copies of "How to Hit Your Market" so that I can distribute it to several other interested parties. *G. S. Aburn, Supervisor, Sales Forecasting Section, The Black & Decker Mfg. Co., Towson, Md.*

Copies are still available.—Ed.

YIPE!



HOW DOES GARRETT GIVE SUCH SERVICE?

What others may call impossible Garrett comes through as routine service. It seems as though they treat each order as the only one in their three plants. Everybody pitches in for service with the customer in mind.

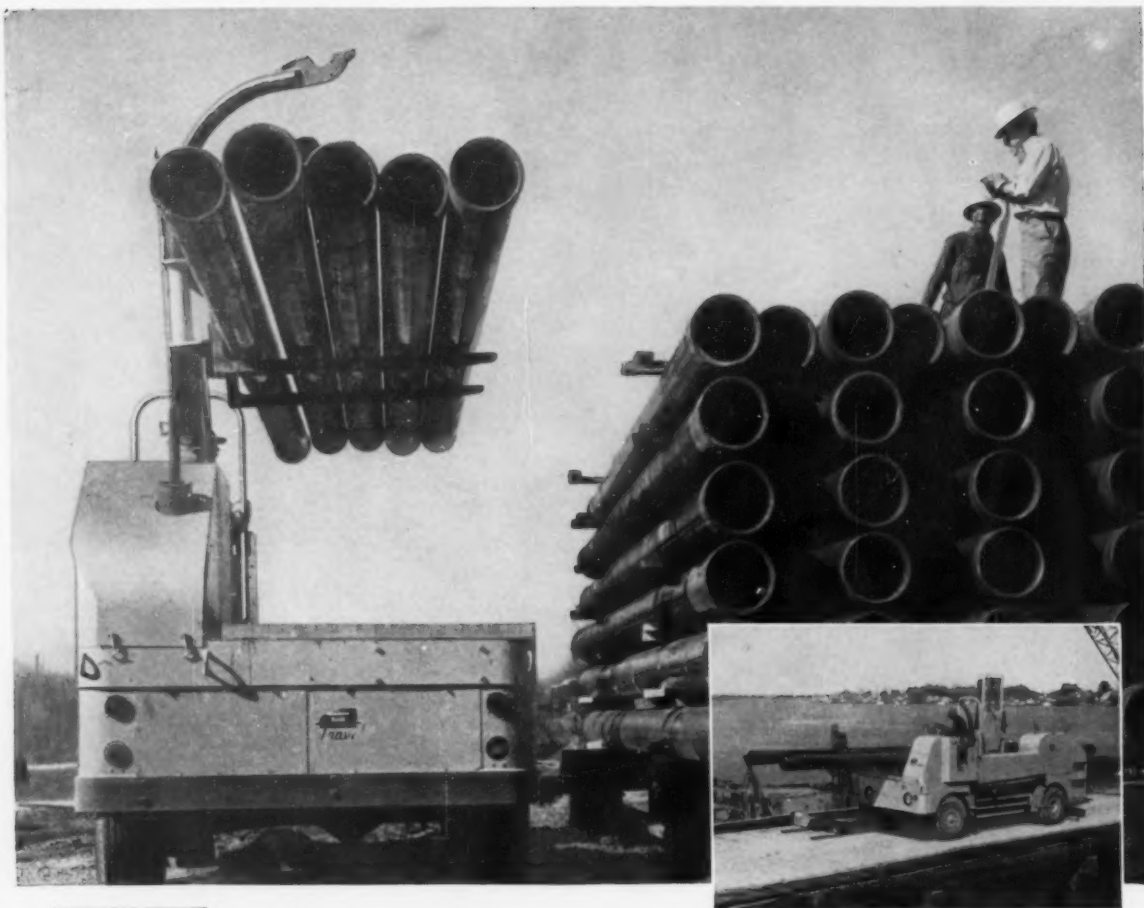
If it is a stock item such as lock washers, flat washers, spring washers or hose clamps the order is usually on the way the same day. If it is stampings or assemblies Garrett engineers, production men and die makers team up to make their high-speed automatic equipment really hum . . . and your order is in your hands in half the time.

Want to be surprised by real service you can't beat? Next time send your order to Garrett for . . .

**LOCK WASHERS
FLAT WASHERS
HOSE CLAMPS
SPRING WASHERS
STAMPINGS**

Manufactured by
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Philadelphia 34, Pa.





***Traveloader* replaces 3 trucks and releases 6 men for other work!**

● A Traveloader is used by Kyle-Taylor Lumber Company, Berwick, La., to transport pipe from river dock to storage. It has replaced two pipe trailers and a gin-pole truck formerly used on this job, reduced man-power required from 15 to 9 and made time savings of about 70%.

This company, serving oil producers, receives pipe in barges at the river dock. A truck crane unloads and places the pipe on the dock. The Traveloader picks it up five lengths at a time, transports it to the storage yard, and stacks it neatly on racks for further disposition.

Time studies reveal the speed with which Traveloader works. Loading time at dock averages 35 seconds. Hauling to storage, stacking and returning to dock

(round trip .55 miles) averages 3 minutes 8 seconds. The stacking part of this operation takes only 24 seconds! As a result the crane at the dock never has to wait for the Traveloader.

Since the company operates 24 hours, 7 days per week, the cost savings are substantial. Moreover, 6 more workers were made available without increasing payroll, and two less mechanized units require maintenance. "This machine is by far the finest that I have seen for handling pipe. It has doubled our capacity with less labor," says Mr. J. E. Kyle, Jr., Vice President.

Write for Bulletin 1360. It completely describes the remarkable TRAVELOADER that carries like a straddle truck, delivers like a road truck, and stacks like a fork truck.

Baker

handling equipment

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672

fatigue cracks

Poker Predictions In the Far North

The world iron ore story on p. 75 really got started eight years ago. On Oct. 22, 1948 Tom Campbell—then Iron Age's News-Markets editor—landed at Burnt Creek in Upper Quebec 1100 miles north of New York City. As soon as he got there he "toured" around the barren land where Canada's Iron Ore Jackpot was sketched out.

Friendly game

On one of the nights at the far north camp a friendly game of poker took place. It was there that the predictions of ore in '54 were made. And it was there that it was foretold that many steel firms would be in this project along with ore for England and Europe.

In two and a half weeks the story appeared in THE IRON AGE. In that yarn—among the first printed about the Quebec-Labrador find—everything that was seen in the cold crystal ball up North has happened; and on schedule. But that wasn't all Iron Age told its readers.

Venezuela "first"

In December 1948 the first story on U. S. Steel's fabulous iron ore find in Venezuela was published in Iron Age. On March 2, 1950 Tom Campbell reported an on-the-spot story of the development; being the first American reporter to visit U. S. Steel's properties.

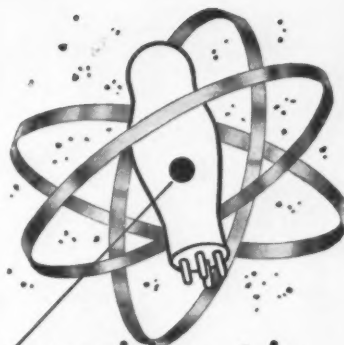
Iron Age readers have been kept up to date on Canadian and South American ore trends. They received the first detailed and authoritative taconite report at least a year before the news became general.

Back of these articles is the personal journalism of THE IRON AGE—an editorial policy which puts you on the scene long before most people are there and analyzes broad practical aspects of new developments.

Over the years, phone calls, mail and telegrams from truck makers, machinery manufacturers, earth movers, banks, railroad equipment people, steel mill planners, iron ore consumers, ship builders and a host of others have testified to the practical effects of America's scramble for iron ore.



Jack Little, then Burnt Creek Camp Boss, and Editor-in-Chief Tom Campbell in Upper Quebec in 1948. This year, as manager of the Quebec North Shore & Labrador RR, Jack Little, has moved down 12-million tons of iron ore from Upper Quebec and Labrador.



precision strip for electronics applications

From 0.0005 in. to 0.040 in. thick and 0.090 to 6 in. wide, these alloys are available as special-tolerance strip:

Beryllium Copper
Phosphor Bronze
Nickel Silver
Brass
Chromium Copper
Stainless 17-7PH
Invar
Magnetic: High Nickel

Some immediately available. Others rolled to order in 2 to 21 days. Can be supplied in coils or straight lengths with slit or filed edges—also cadmium plated.

Write for Bulletin 7
TODAY.

PENN

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of
GREY IRON CASTINGS

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**ONE OF THE NATION'S
LARGEST AND MOST MODERN
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ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

**MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE**

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dates to remember

DECEMBER

Institute of Appliance Manufacturers—Year-end conference, Dec. 3-4, Netherland Plaza Hotel, Cincinnati, O. Society headquarters, The Shoreham Hotel, Washington, D. C.

American Institute of Mining, Metallurgical, and Petroleum Engineers—Annual Conference, Dec. 5-7, Morrison Hotel, Chicago. Society headquarters, 29 W. 39th St., New York.

American Institute of Chemical Engineers—Annual meeting, Dec. 9-12, Statler Hotel, Boston. Society headquarters, 25 W. 45th St., New York.

EXPOSITIONS

American Society for Metals—March 25-29, Los Angeles.

American Foundrymen's Society—May 6-10, Cincinnati.

The Material Handling Institute—Annual meeting, Dec. 10-11, Biltmore Hotel, New York. Society headquarters, One Gateway Center, Pittsburgh, Pa.

JANUARY

Institute of Scrap Iron & Steel Inc.—Annual convention, Jan. 13-16, Eden Roc and Fontainebleau Hotels, Miami Beach, Fla. Society headquarters, 1729 H St., N.W., Washington, D. C.

Society of Automotive Engineers, Inc.—Annual meeting, Jan. 14-18, The Sheraton-Cadillac and Statler Hotels, Detroit. Society headquarters, 29 W. 39th St., New York.

The Society of Plastics Engineers, Inc.—Annual national technical conference, Jan. 16-18, Hotel Sheraton-Jefferson, St. Louis, Mo. Society headquarters, 34 E. Putnam Ave., Greenwich, Conn.

Malleable Founders' Society—Semi-annual meeting, Jan. 18, Hotel Cleveland, Cleveland. Society headquarters, 1500 Union Commerce Bldg., Cleveland.

Compressed Gas Assn., Inc.—Annual meeting, Jan. 21-23, Waldorf-Astoria, New York. Society headquarters, 11 W. 42nd St., New York.

American Standards Assn.—Gaillard seminar on industrial standardization, Jan. 21-25, Engineering Societies Bldg., New York. Society headquarters, 70 E. 45th St., New York.

Industrial Heating Equipment Assn., Inc.—Annual meeting, Jan. 28-29, The Shoreham Hotel, Washington. Assn. headquarters, 1145 19th St., N.W., Washington, D. C.

HERR

EQUIPMENT

"Complete Processing and Handling Equipment . . . for any Ferrous or Non-Ferrous Material . . . That Starts — or Ends — as a Coil"



AUTOMATIC STITCHERS

Fast, dependable method of fastening the lead end of a new coil to the trailing end of a preceding coil. Entirely automatic. Produces a double row of locked stitches. Practical for strip of any width. Your samples stitched and returned promptly. Also automatic welders.



SHEARS



Fast acting single shears for use with hump tables in cut-to-length and press feed lines, and other applications to square crop the end of a coil. Also twin cut shears that remove the section where two coils were stitched or welded together for continuous processing.

Write for fully descriptive Bulletin No. 561 today!



THE HERR EQUIPMENT CORPORATION

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CLEVELAND, INDIANAPOLIS AND BERKELEY, CALIFORNIA



Painting is easier with a bucket which has a dependable, easy-to-use handle made from low carbon, hard drawn CF&I-Wickwire Pail Bail Wire.

Chances are you don't need pail bail wire to make paint bucket handles. But *you may need one or more of the nearly 100 different categories of specialty wire for which CF&I-Wickwire is famous.* Let us show you how we can meet your most rigid chemical and physical specifications on high and low carbon wire in all sizes, shapes, tempers, finishes and grades.

the painter's helper



Check This List!

FOR THE WIRE YOU REQUIRE, SEE CF&I-WICKWIRE.

FLAT AND SHAPED WIRES

Armor Wire
Bobby Pin Wire
Bookbinder Wire
Brush Wire
Casing Wire
Cotter Pin Wire
Curtain Spring Wire
Die Spring Wire
Gutter Broom Wire
Lock Spring Steel
Rake Tine Steel
Regulator Spring Wire
Snake Fishing Steel
Stapling Wire for Preformed Staples (Flat)

LOW CARBON FINE AND SPECIALTY WIRE

Bee Wire
Bonnet Wire
Bookbinder Wire
Broom Wire
Clip Wire
Dent Spacer Wire
Drapery Pin Wire
Florist Wire
Fuse Wire

Glass Netting Wire
Hairpin Wire
Hook and Eye Wire
Mattress Wire
Picture Cord Wire
Picker Tooth Wire
Pin Ticket Wire
Pin Wire
Ring Traveller Wire
Spiral Binding Wire
Stapling Wire
Stapling Wire for Preformed Staples
Stone Wire
Weaving Wire
Weaving Wire for Fly Screen Cloth
Wissco Iron Wire

HIGH CARBON FINE AND SPECIALTY WIRE

Aircraft Cord Wire
Armor Wire
Belt Hook Wire
Bobbin Ring Wire
Brush Wire (Tempered and Untempered)
Brush Wire (High Strain)

Chrome Vanadium Spring Wire
Core Wire (Aluminum Cable Steel Reinforced)
Curtain Spring Wire
Flexible Shaft Wire
"Gamma" Spring Wire (Upholstery Spring Wire)
Zig Zag Wire
No-Sag Wire
Hat Wire
Heddle Wire
Hose Reinforcement Wire
Hose Wire, Mechanical
Hose Wire, Vacuum and Defroster
Rope Wire
Signal Corps Wire
Spoke Wire
Hard Drawn Spring Wire
Oil Tempered Wire
Spheroidized or Annealed Spring Wire
Tire Bead Wire
Valve Spring Wire

MANUFACTURERS LOW CARBON COARSE WIRE

Bag Tie Wire

Basket Handle Wire
Box Binding Wire
Brush Handle Wire
"Cal-Tie" Wire
Can Key Wire
Case Hardened Ball Wire
Chain Wire
Clamp Wire
Clothes Pin Wire
Concrete Wall Reinforcement Wire
Garment Hanger Wire
Hay Baling Wire (Coiled)
Lingo Wire
Lintel Wire
Loop Wire
Merchant Quality Wire
Pail Bail Wire
Rivet Wire
Stapling Wire
Strand Wire
Tying Wire
Welding Wire
Wissco Iron Wire
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Heading, Forging or Roll Threaded Quality Wire
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CF&I-WICKWIRE WIRE

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4243



WHEN YOUR PRODUCTION LINE'S IN TROUBLE Get "ELL" & "ESS" On the Double!

So heads are shearing off, threads are stripping and the fit's none too good.

Somebody pulled a "boner" . . . probably tempted by a cut-rate price.

Pretty expensive "saving" isn't it?

There's a lot more behind a fastener than the price tag it carries:

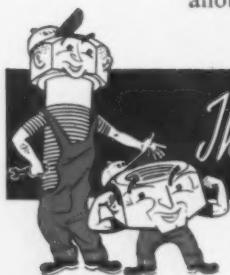
EXPERIENCE, QUALITY, "KNOW-HOW", REPUTATION AND ENGINEERING SERVICE.

But all is not lost. Get "Ell" & "Ess" on the line and this experienced pair will pull your irons out of the fire!

Lamson & Sessions ("Ell" & "Ess", to you) have been called in on many a

"foul up" and haven't failed yet to put their knowing fingers on the cause.

So, if double trouble sets in, let "Ell" & "Ess" give you a hand. It's another extra and free service to you from Lamson & Sessions.



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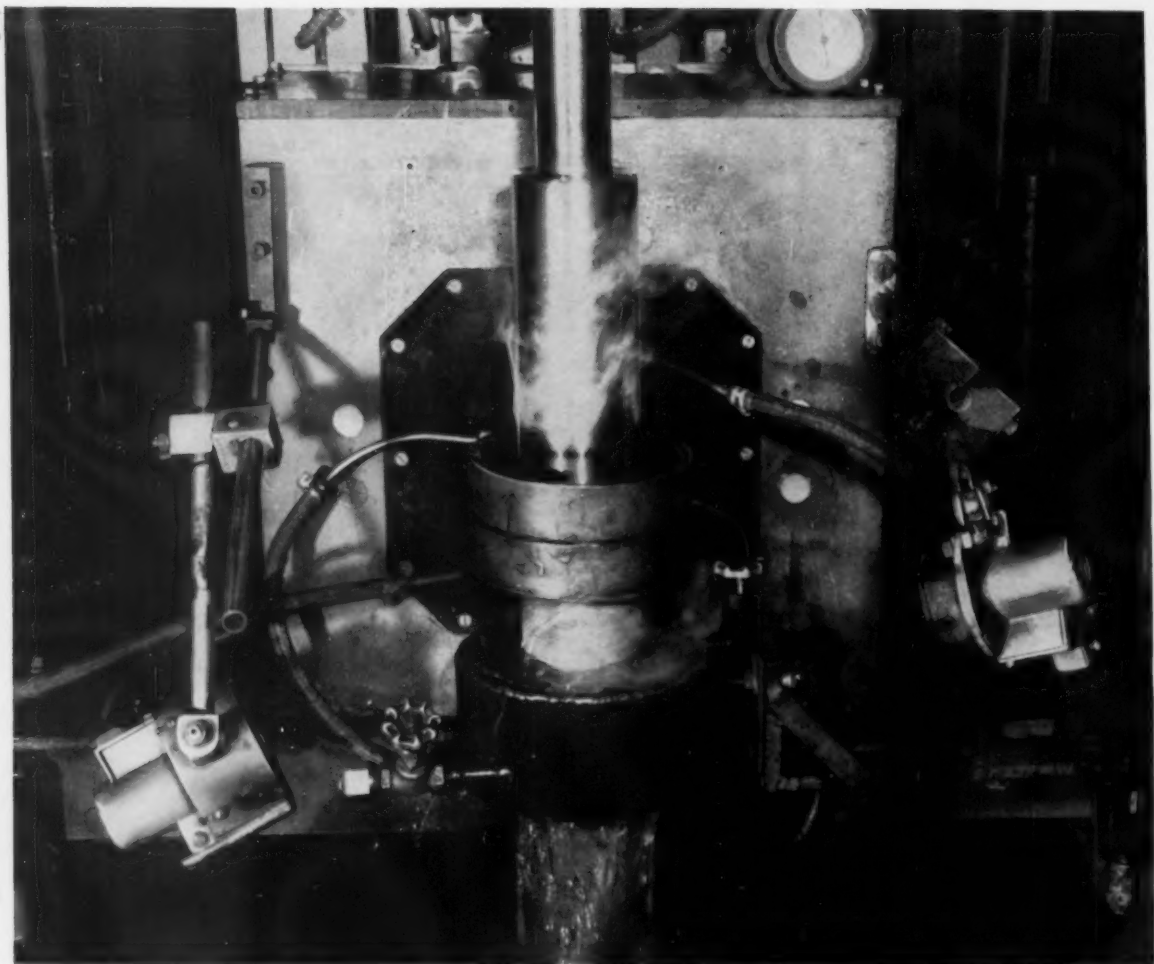


You save when you specify JESSOP
stainless clad steel

If you fabricate any type of large vessel which requires the protection provided by stainless steel, it will pay you to investigate Jessop's famous stainless clad plate for several very good reasons. First: you save money and vital alloys—stainless cladding is from 5 to 50 percent on a mild steel backing. Second: you get quicker delivery. Third: you enjoy easier fabricating. Also, you can depend on the bond between the steels remaining intact. Twenty years ago, Jessop pioneered stainless clad and its patents are still superior. The degree of cladding is always guaranteed. Last, but far from least, you will be doing business with an organization dedicated to good products and good service—a team that considers satisfied customers its most important asset. Write to us.

JESSOP

STEEL COMPANY • WASHINGTON, PENNSYLVANIA



Soaking up heat radiation...

... these two L&N Rayotube® detectors are helping McKay Machine Company induction-harden bodies of leveller rolls. About four years ago, this manufacturer of sheet, tin and strip mill equipment switched to full time induction hardening of these shafts which range from $\frac{7}{8}$ " to 12" in diameter and up to 12' long. The new method doubled production ... eliminated warpage ... and provided scale-free hardening. And, in addition, the use of L&N temperature control enabled the McKay Machine Co. to reduce setup time ... eliminate trial runs ... and produce the same results heat after heat.

The temperature regulating equipment con-

sists of Speedomax®-Rayotube control on each of two 3000-cycle induction generators having a maximum capacity of 400 kw. One Speedomax in combination with a Rayotube detector controls work temperature by operating a motor-operated rheostat to regulate power input to the induction coil. For quality control, a second Speedomax-Rayotube combination measures and records quench temperature while a third Speedomax provides a record of work speed through the coil.

To find out how L&N temperature control may help increase the efficiency of your induction heating, contact your nearest L&N sales office or write 4956 Stenton Ave., Phila. 44, Pa.

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**It cuts through or pares
with the greatest of ease**

Rugged jobs that crack ordinary wheels are no problem for CARBOFLEX[®] Cut-Off Wheels by CARBORUNDUM! The fiber-reinforced resin bond is designed to withstand extremes of side pressure and heat shock. This extra strength means maximum safety...plus two to three

times longer wheel life! Both sides of CARBOFLEX[®] wheels are knurled, to eliminate binding. There's no flexing and drifting, even on long cuts or uneven surfaces. CARBOFLEX[®] Cut-Off Wheels come in four gradings, in diameters up to 20 inches, for every cutting, notching, slotting job.

A phone call to your CARBORUNDUM Distributor or salesman will set up a trial in your shop. For Folder A-1298, giving applications and recommendations, write The Carborundum Co., Niagara Falls, N. Y. In Canada: Canadian Carborundum Co., Ltd., Niagara Falls, Ontario.

Through application "know-how" and product quality

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continually puts more **sense** in your abrasive **dollar**



He Helps Sell Your Products With **TORRINGTON NEEDLE BEARINGS**

This Torrington Sales Engineer has been discussing a customer's product and how it can be made more salable through the unique advantages of Needle Bearings.

He has told the manufacturer about the features that can be added to his product through the use of Torrington Needle Bearings—such as more compact design, space and weight savings, higher load capacity and less maintenance.

These inherent characteristics of the Torrington Needle Bearing, plus the knowledge and skill of our engineering staff, have made the Needle Bearing "standard equipment" in thousands of products, often improving their salability. May we tell you how the Needle Bearing can help you?

See our new Needle Bearing Catalog in the 1956 Sweet's Product Design File—or write direct for a catalog.

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Give you these benefits

- low coefficient of starting and running friction
- full complement of rollers
- unequalled radial load capacity
- low unit cost
- long service life
- compactness and light weight
- runs directly on hardened shafts
- permits use of larger and stiffer shafts

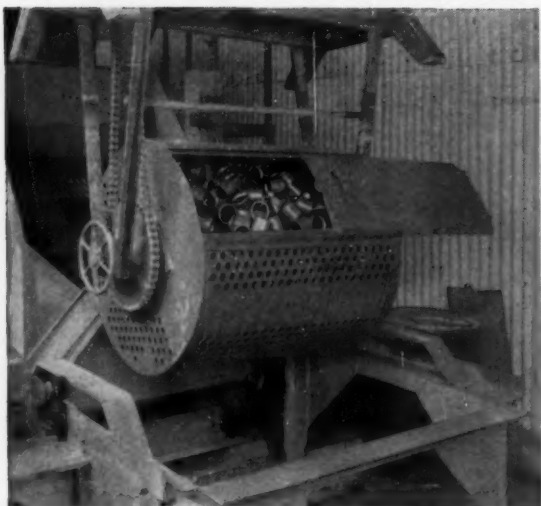


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TORRINGTON BEARINGS

Needle • Spherical Roller • Tapered Roller • Cylindrical Roller • Ball • Needle Rollers



This WELDCO Drum Pickler holds up to 1200 lbs. of couplings or small parts.

At Wheeling Steel's Benwood Works



Give **Fast, Uniform, Low-Cost Pickling**

Are you pickling small parts, stampings, forgings, or castings? Then your plant needs the fast, efficient, uniform action of a WELDCO Mechanical Drum Pickler.

Wheeling Steel Corporation, for instance, installed 7 WELDCO Monel Picklers in their new coupling department over a year ago, and report substantial savings already: (1.) The pickling operation is now continuous. (2.) Pickling time has been cut 50% to 60%. (3.) Output has been increased to 6000 lbs. per hour. (4.) Labor cost, and acid consumption per ton, have been considerably reduced.

These WELDCO Drum Picklers provide a stirring, rolling, tumbling action, giving better, more uniform, more efficient, faster pickling. The parts inside the drum are constantly moving and rotating, with all surfaces equally exposed to the acid. That's especially important in Wheeling's case because the material, after pickling, goes directly to the Galvanizer, and the cleaning **must** be thorough and uniform.

WELDCO's superior design and construction guarantee a good pickling job every time . . . and Monel's corrosion-resistant qualities mean years of service with no maintenance or replacement problems. Let WELDCO's pickling specialists show you how to save time and money with a Mechanical Drum Pickler. A letter or phone call brings a WELDCO engineer to your plant with all the facts!



One of Wheeling's 7 WELDCO Drum Picklers, used for pickling couplings.

WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO.
3723 OAKWOOD AVE. YOUNGSTOWN 9, OHIO



symbols

- a = Addendum
- C = Center distance
- c = Clearance
- d = Nominal pitch diameter of worm
- d_o = Outside diameter of worm
- d_r = Root diameter of worm
- D = Nominal pitch diameter of gear or diameter of central plane of gear
- d_g = Pitch diameter of gear
- d_w = Pitch diameter of worm
- L = Length of gear
- L_w = Length of worm
- P = Pitch
- P_w = Pitch of worm
- W = Width of gear
- W_w = Width of worm

WORM GEARING

by "Phillie Gear" assures
you accuracy...efficiency
...dependability



worm gearing

Worm grinding is an operation which is essential to successful worm gear operation...When worms are heat-treated for maximum surface hardness, the hardening process often produces changes in the lead angle and tooth profile, and always leaves a rough scaly surface on the threads. Worm thread grinding will correct errors of lead and profile, and produce a mirror-smooth surface finish, which is highly important to worm gear tooth action. Philadelphia worms up to 12" pitch diameter, 1 diametral pitch, are thread ground on our modern equipment.

Compactness • High Shock load and over-load capacity • Easy maintenance • Interchangeability of Components • Smooth torque flow • Positive control of work on driven machines • Long service life (worm gearing frequently improves with use) • Trouble-free performance • Good efficiency.

Any Worm Gearing, is, of course, only as good as the knowledge and equipment of its maker, plus the quality of alloys and methods used in making both Worm and Worm gear—This is where "Phillie Gear" is really tops.

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INDUSTRIAL GEARS & SPEED REDUCERS • LIMITORQUE VALVE CONTROLS • FLUID MIXERS • FLEXIBLE COUPLINGS

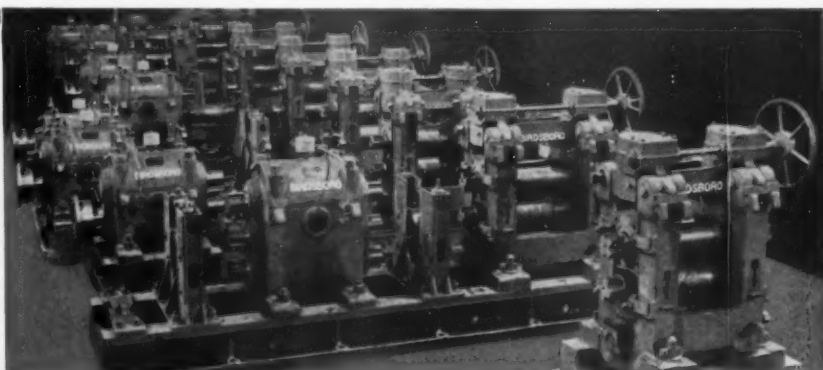
Virginia Gear & Machine Corp. • Lynchburg, Va.

See the newest developments in Mechanical Power Transmission at our Booth #80—22nd National Power Show, New Coliseum, New York City, November 26-30.

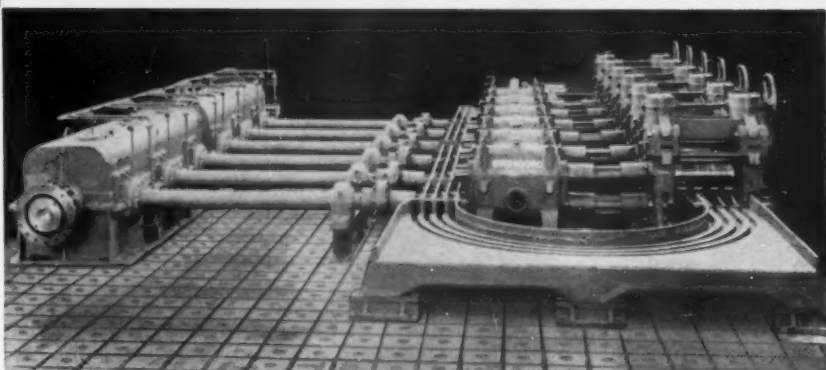
Put Your Steel Production Ideas Into Action Through **BIRDSBORO**

Right now, you have ideas on how production from your mill can be increased, quality improved or savings made. This may be the time to think about putting them to work. When you do, call in BIRDSBORO, specialists in *customized* mill machinery. Direct our large and varied facilities toward *your* goals. Take advantage of production experience that has included many of the most important advancements in the industry. The first step . . . contact your BIRDSBORO representative.

**Roll Stands and Pinion
Stands for 10" Rod Mill**



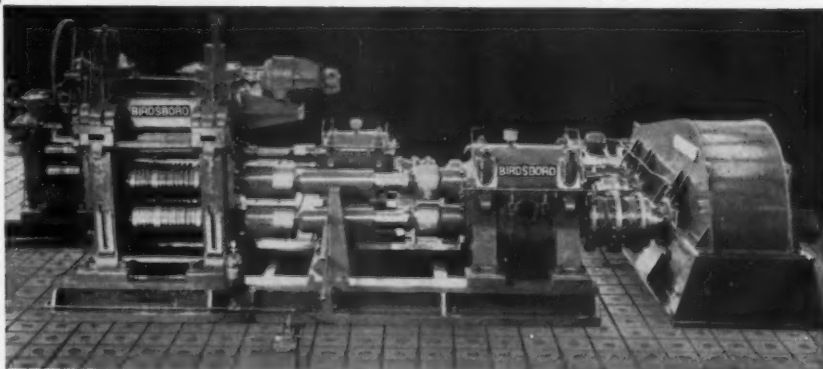
**12"—6 Stand Continuous
Rod Mill and Drive**



16"—10" Bar Mill

**DESIGNERS
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STEEL MILL MACHINERY
HYDRAULIC PRESSES
(Metalworking and Extrusion)
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MM33-56

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INJUN GAME NOT TOO TAME

(Junior's control helps make a goal!)



PRINCESS WENATCHEE:
"Another goal for Junior!
Control help him win."

CHIEF KEOKUK:
"Control? He trip me up."

CHIEF KEOKUK JR.:
"Injun Lacrosse, like any game
— not too tame!"

Control can net a profitable return in Lacrosse . . . and in processing iron and steel! Foundries and steel plants everywhere control costs and quality with Keokuk Silvery Pig Iron . . . the superior form of silicon introduction. Pig for pig, car for car,

its uniformity never varies. Handle it by magnet . . . charge it by weight (or count the piglets for equal accuracy). Leading aluminum producers specify Keokuk Silicon Metal for uniform high purity. When you think of silicon, think of Keokuk!



KEOKUK

ELECTRO-METALS COMPANY

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SALES AGENT: MILLER AND COMPANY

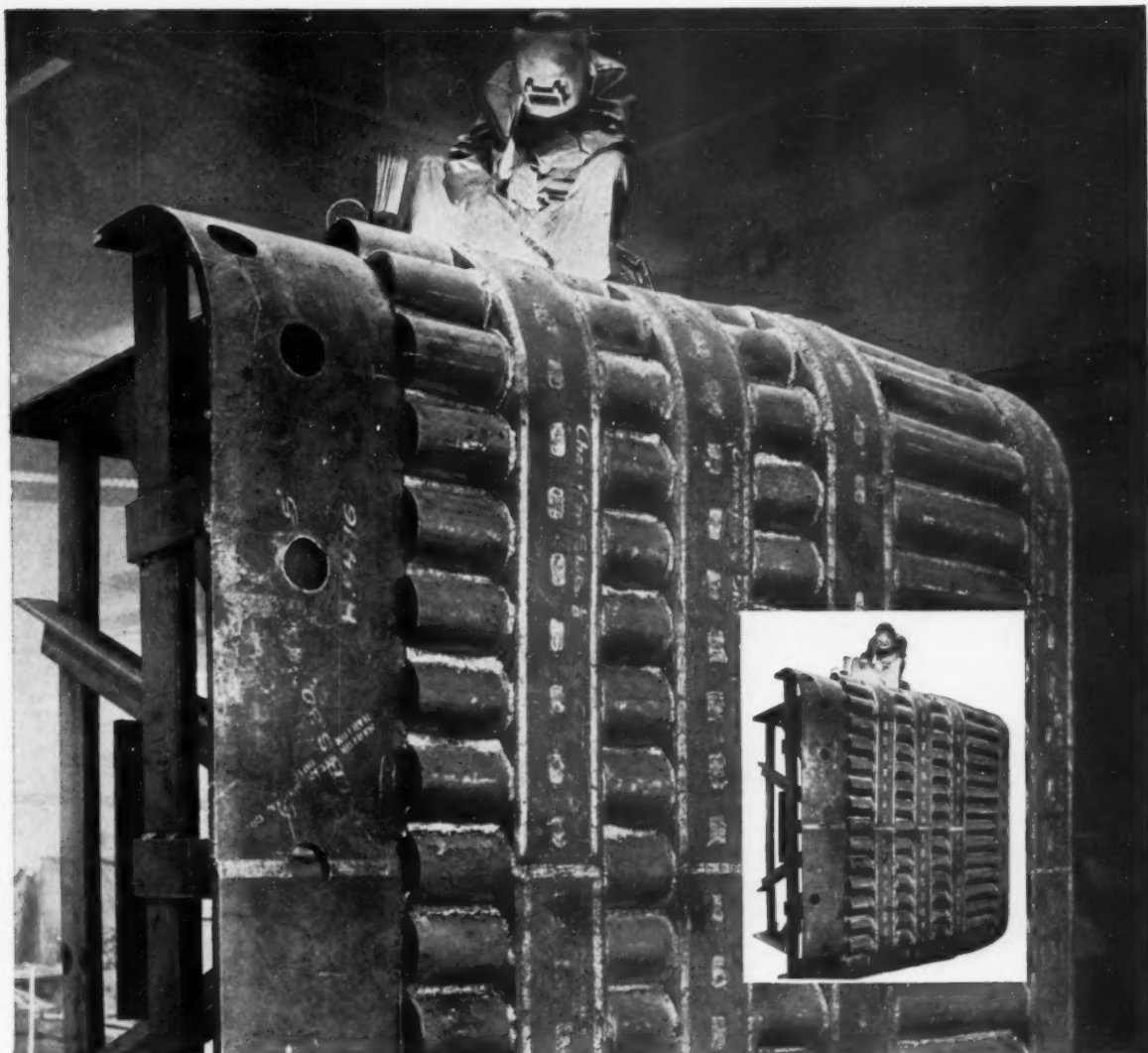
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Keokuk Silvery Pig Iron is available in 60 and 30 pound pigs and 12½ pound piglets . . . in regular analysis or alloyed with other elements to match your requirements.





Another huge dipper for a Marion type 5561 stripping shovel—made entirely of Lukens "T-1" steel for extra strength, impact and

abrasion resistance—in the shops of Marion Power Shovel Company, Marion, Ohio.

Fabricator of power shovels says:

"LIKE THE WAY TOUGH LUKENS 'T-1' STEEL WELDS AND HANDLES IN THE SHOP"

■ Marion Power Shovel Company's 45 cubic yard stripping shovels now deliver greater payloads with lower maintenance costs and longer service life at the strip mines. Sixty tons of Lukens "T-1" steel in the dipper stick, bail, door, and the dipper itself do the work that once took many extra tons

of ordinary steels. And Marion has experienced "no unusual welding problems since switching to this extremely high yield strength metal . . . very satisfied with the way it handles in the shop."

Lukens "T-1" steel is available in the widest range of plate sizes anywhere.

Figure it in your new plans.

Our 24-page illustrated booklet, **LUKENS "T-1" STEEL**, will help show you the way. Write to Manager, Marketing Service, Lukens Steel Company, 847 Lukens Building, Coatesville, Pennsylvania.

Do it now!

LUKENS "T-1" STEEL

TRADE MARK



THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS
LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA



Everyone

in your organization
should know...

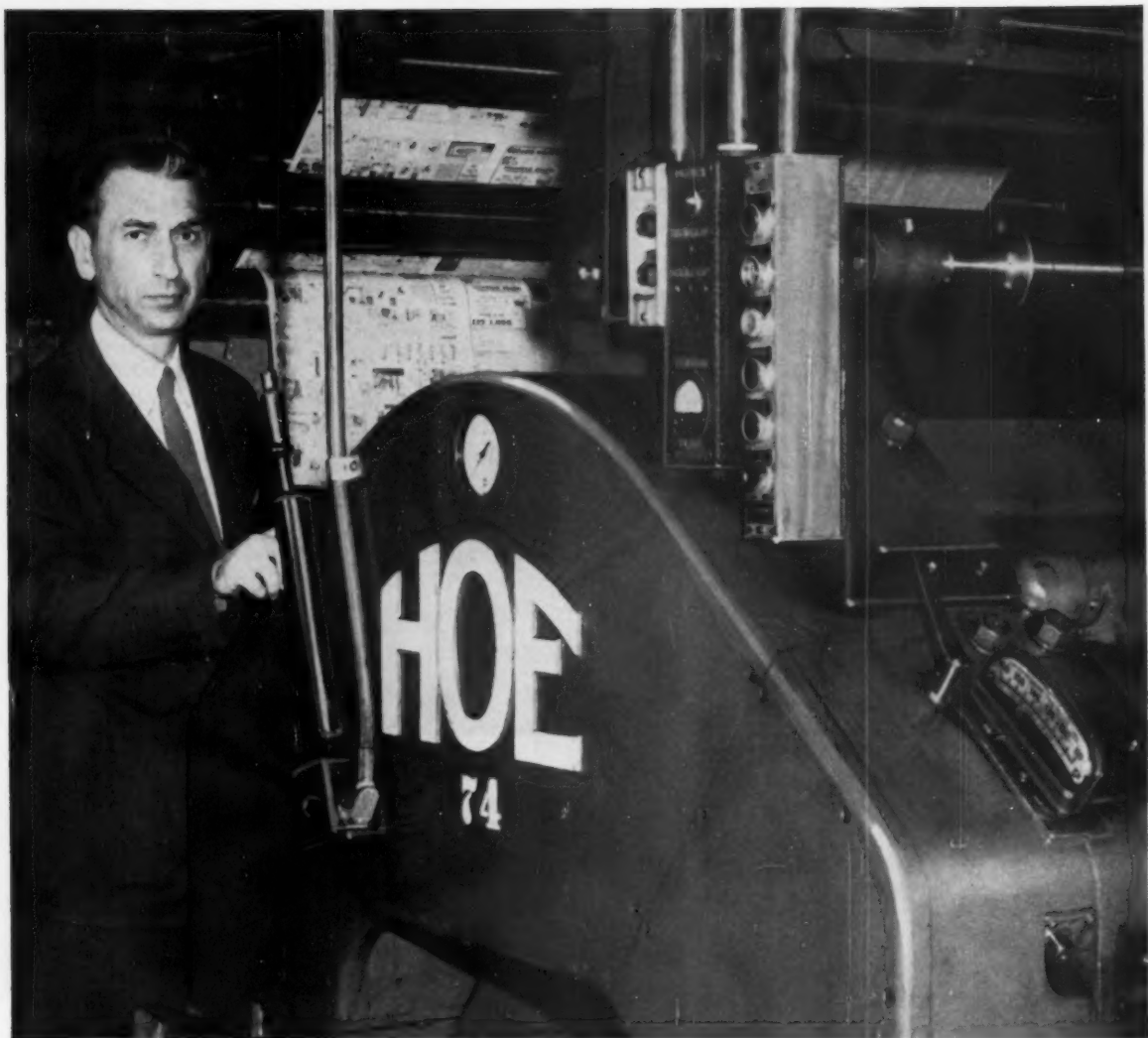
that our reputation in producing quality iron ore (Jaspersy Ores included) is borne out by more than one hundred years of experience.

Our company in conjunction with other American industries has helped build this nation in peace and furnished the sinews for war. The Cleveland-Cliffs Iron Company's Great Lakes fleet of 17 vessels carries our ore to every port in the prime industrial area of the United States. Consult us about your Ferro Alloys and Coal Needs.

IRON ORE ★ ALLOYS ★ VESSEL TRANSPORTATION ★ COAL

The Cleveland-Cliffs Iron Company

UNION COMMERCE BUILDING • CLEVELAND 14, OHIO



MORE POWER TO THE PRESS

with easier-rolling SKF® spherical roller bearings

Here is the new R. Hoe & Co., Inc., black press at the Los Angeles Times getting a final examination by SKF's Senior Division Engineer Paul W. Dunlap before it starts regular operations. Representing an entirely different concept of design, this press includes 16 black printing units, each of 16-page capacity, and two double folders, with provision for a variable number of color couples.

Self-aligning, SKF Spherical Roller Bearings keep the sensitive Printing Cylinders running smoothly while other types of SKF bearings are used at strategic points throughout. Per-

formance: Good, clean impressions on faster runs, with all-around operating efficiency. No matter what type of equipment you design or build, you can always rely on an SKF engineer to help you select the *right* bearing for the job.

7725

EVERY TYPE—EVERY USE

SKF

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REPUBLIC ALLOY

A 3/4-inch Republic Alloy Steel Double Chain Sling is used to move this four-ton gear blank safely and easily. Republic Alloy Slings are ideal for applications demanding lightweight and extremely high-working load limits.



REPUBLIC



World's Widest Range of Standard Steels

STEEL CHAIN SLINGS

Are Safe, Strong, Lightweight, Easy to Handle

For hazardous, heavy-duty lifting and overhead materials handling, nothing exceeds the modern chain sling made from *alloy steel*. This means it is one of the safest, strongest and toughest pieces of equipment you can have around the shop.

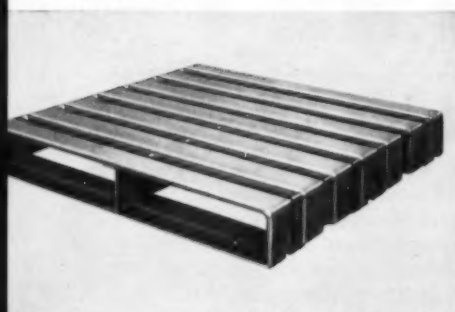
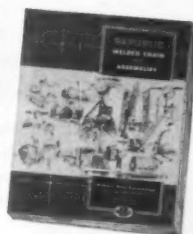
Republic enters the alloy chain sling picture in three ways. (1)—Republic is the world's largest producer of alloy steels. (2)—The high strength-to-weight ratio and corrosion-resistance of Republic Alloy Chain have encouraged the use of smaller and lighter chain slings to carry heavier loads safely. Also resulting in greater efficiency, longer service life and ultimate economy. (3)—Craftsmen at Republic's Bolt and Chain Division form the alloy steel into chain, then into chain slings engineered for the highest degree of safety. Each sling is proof tested and warranted to meet or exceed specifications.

Republic Alloy Chain is made from special analysis open hearth steel, quality controlled from ore to finished product.

It is heat treated to develop the highest possible tensile strength and maximum resistance to wear, shock, strain and work hardening. Stress relieving or reheat treating is unnecessary.

Your Republic Chain Distributor has complete information on alloy slings, high test steel and wrought iron slings, as well as fittings, and accessories.

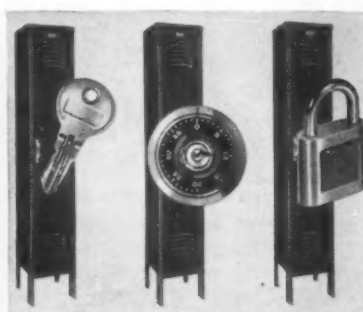
This New Republic Catalog contains complete information and the latest, up to date specifications on Welded Chain, Accessories and Assemblies. It's a colorful, 62-page book loaded with everything you need to know about welded chain. Order your copy from your Republic Chain Distributor. Or write us direct. Ask for Catalog 701.



SAFETY DIRECTORS APPROVE OF REPUBLIC STEEL PALLET. There are no sharp edges or projections to injure workmen or damage containers. Republic Pallets are fabricated from steel to eliminate maintenance expense—designed to eliminate broken deck members and stringers, protruding fasteners and joint failures. Republic Steel Pallets are available in many styles including the P-16-S Semidouble Face shown above. Write for Pallet Booklet No. 616.



SAFETY IS A BUILT-IN FEATURE OF REPUBLIC WEDGE-LOCK STEEL SHELVING. It is specifically designed for high stacking of enormous weights. Joints actually get tighter as weight increases. And there's no sagging, swaying or buckling. Wedge-Lock Steel Shelving provides maximum loading in minimum floor space. It is completely flexible to meet your changing space requirements and can be assembled quickly and easily.



SAFETY OF EMPLOYEES' PERSONAL PROPERTY is provided by Republic Steel Lockers with a choice of three locking systems—combination—padlock—key operated. These modern steel lockers, available in many types and styles, conserve space and offer clean, safe storage for employees' clothing and valuables. Republic's Berger Division offers a complete locker planning, engineering and installation service. Send coupon for more information.

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| <input type="checkbox"/> Chain Slings | <input type="checkbox"/> Steel Pallets |
| <input type="checkbox"/> Wedge-Lock Steel Shelving | <input type="checkbox"/> Lockers |
| <input type="checkbox"/> Send Welded Chain Catalog 701. | |

Name _____ Title _____

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Morton machinist, working to very close tolerances, turns a special flanged bearing from Johnson Bronze cored bar.



Mr. Jack E. Morton, Director of Purchases, and Mr. Russel A. Olovson, Production Manager, checking bushings for Morton's new steel coil splicer.

How the Johnson Bronze Distributor in Muskegon Helps Morton Manufacturing Co.

For over twenty-five years Morton Manufacturing Company has depended upon Johnson Bronze to supply its varied requirements for bushings and bar stock. As a maker of custom machinery, Morton uses a range of bushings so wide that inventory control could be both costly and complicated. The Johnson distributor in Muskegon eliminates this potential source of trouble.

"The large assortment of sizes which our local distributor carries in inventory enables us to minimize our own inventory without hampering production," says Mr. Jack E. Morton, Director of Purchases. "We have also found that the service provided by Johnson Bronze through their district

representative and local distributor has helped us to better understand bronze bearing applications.

"The precision machining of the Johnson General Purpose bushings reduces our time required for application. The uniformity of material, both in the bushings and the solid and cored bar stock from which we machine special shapes and sizes of bushings, guarantees maximum life."

Your local Johnson Bronze distributor is ready to provide you with the same fine service and high quality products which Morton receives. Consult him the next time you need bushings, bearings or bronze bars. Johnson Bronze Co., 505 S. Mill Street, New Castle, Pennsylvania.

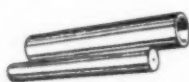
JOHNSON Bearings



GRAPHITED
over 175 sizes



GENERAL PURPOSE
over 900 sizes



UNIVERSAL BRONZE BARS
over 400 sizes



LEDALOYL
over 400 sizes



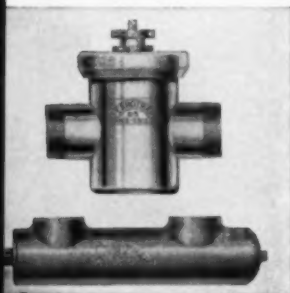
ELECTRIC MOTOR
over 350 sizes

MAGNET MOCKS MIGHTY MUSCLEMAN!

This rugged weight lifter is certainly no "97 lb. weakling" but no matter how he grunts and groans he'll never be able to lift this weight. It's held in place by an Eriez HI-POWR permanent magnet bolted to the floor. (The weight was finally broken from the magnet's attraction by two strong men using hardwood pry-bars). This idea of herculean power now offers the metalworking industry many new ideas for automatic control and conveying of steel. Eriez permanent magnets to separate, retrieve and purify have also been used to solve hundreds of other production problems.

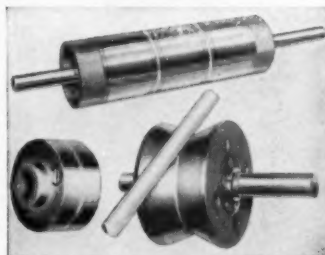


Magnetic ideas from **ERIEZ**



ERIEZ PERMANENT MAGNETIC PIPELINE FERROTRAPS

Most efficient magnetic separators for removing unwanted iron from most anything that flows through a pipeline! Two styles, depending on diameter of pipe or special need. Either type is quickly installed, easily cleaned by merely removing the magnetic element. Three to four times more magnetic area than old-style pipeline separators. Withstand high pressures. Ideal units for removing large iron contamination and microscopic fines from coolant lines, circulating oil systems, etc.



ERIEZ MAGNETIC ROLLS

Small-diameter, flat-faced: V-type pipe control. Installed singly or in groups, flat-faced permanent magnetic rolls are extremely useful for automatic feeding, conveying and spot control of sheets. Eliminate drifting, cobbles, untrue cuts . . . reduce downtime and rejects. Provide absolute control during baking, painting, trimming, etc. Easily installed on present systems. Eriez V-type rolls control and convey pipe from one location to another at capacity speeds, horizontally, vertically or up inclines. Positive hold prevents rebound, assures control during many operations. Decrease take-away time, provide shorter conveyor lines, eliminate direct drive rolls and motors.

Eriez factory-trained field men, backed by extensive laboratory and engineering know-how, will be happy to study your particular metal handling problem and offer helpful "Magnetic Ideas." Our representatives are always glad to work with your engineering department or consulting engineers on any problem, large or small. For additional information concerning magnetic problems in the metalworking industry, or for additional data concerning any of the products shown, write to Eriez Manufacturing Company, 100L Magnet Drive, Erie, Pa.

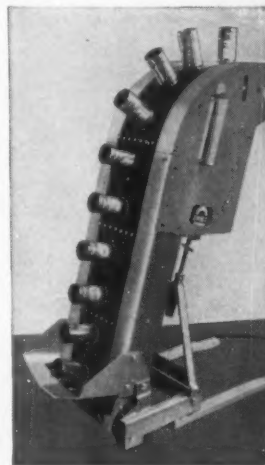
Important metalworking news!

**How you can hold . . . control . . . and
convey with Eriez Permanent Magnets!**

An entirely new concept in conveying and controlling metals and metallic parts is made possible by the introduction of Eriez Permanent Magnets to the metalworking field. Used for years as magnetic separators in varied industries, these lifetime-powered magnets offer many new ideas for automation. Eriez HI-POWR magnets are so strong they can bring moving metal to a dead stop. And they convey pipe, tubes, sheets, conduits, etc., at high speeds to maintain peak production. Pickup is faster, and there's less product damage caused by slippage and sag. Less conveyor space is needed (Eriez Magnets convey horizontally, vertically and up steep inclines). And no electric motors are required; you get years of trouble-free service with no power consumption. *All Eriez Magnets are non-electric, self-contained. They have no wires or attachments. Powerful Alnico V magnetic elements are guaranteed indefinitely. There is no operating cost; first cost is the only cost.*

ERIEZ MAGNA-MOVER (MAGNETIC CONVEYOR-ELEVATOR)

For automatic handling of such ferrous items as nails, bolts, cans, blanks, scrap, finished parts, etc. Moves materials at speed of 85 FPM, up inclines to 90°. Needs only 18½" x 37" floor space; fork-like legs (1½" high) fit under tables, machines, etc. Gently curved radius permits handling of relatively large objects. Lowers production costs; increases output. Hopper prevents loss of small parts being fed to the conveyor. Extended transition section for easy discharge into bins, pallets or other machinery. Also available: *Magna-Rail* — easily installed on existing lines directly under belt to convert ordinary belt conveyors into magnetic conveyor-elevators for all metal parts.



New! Eriez HI-VI Vibratory Equipment

First complete line of electro-permanent magnetic equipment operating at 3600 CPM directly off an AC line. No rectifier needed! . . . just plug in. Greater vibratory output with less power consumption. Less maintenance; lower installation costs. Lifetime-guaranteed Alnico V magnetic element (heart of the unit) produces an exclusive "double action" drive for more productivity.

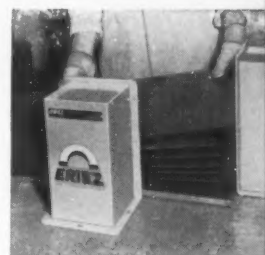


Write for complete information on HI-VI Unit (bin) Vibrators to keep bulk materials flowing freely. HI-VI Vibratory Feeders for accurate, controlled feed.



ERIEZ SHEET FANNER MAGNETS

Here's the magnet to speed up sheet metal handling and increase production. Slow, costly hand separation is completely eliminated . . . no more double feeding, no scratched surfaces, no cut fingers. An Eriez Sheet Fanner Magnet placed next to a pile of sheet metal automatically lifts the top sheet into the air, allows fast, safe removal. When the top sheet is removed, the following one automatically rises. Ideal for irregular and odd-shaped sheets. Available in five strengths.



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 Cincinnati, Ohio
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Cleveland, Ohio
 PRospect 1-4384
 Dayton, Ohio
 MICHigan 7456
 Detroit, Michigan
 TYler 5-0500
 Hartford, Connecticut
 JAcKson 7-7174
 Houston, Texas
 (currently moving
 to new warehouse)

Indianapolis, Indiana
 MElrose 2-5401
 Los Angeles, California
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at the people waiting to go into action when you call

Have you called Carpenter lately?

When you do, we believe you'll find a personal satisfaction in getting the kind of specialty steel service you want and need today.

The people shown here are typical of the specialists in the Carpenter Mill-Branch Warehouse near you. Working as a team, they offer you increasingly better service on specialty steels.

Suppose, for example, you need fast delivery on a tool, stainless or alloy grade. From the man on the order desk . . . to the one who processes your order . . . to the man who delivers it — each one does his best to earn your business.

What's more, they're backed by unusually ample stocks of all grades and sizes of *Carpenter Quality* steels. Short lengths can be quickly processed to meet your most exacting requirements . . . your most pressing emergencies.

In addition, information on prices, sizes and grades is yours for no more than a phone call.

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To get this full measure of service on specialty steels, call the Carpenter Mill-Branch Warehouse nearest you. See what a difference it makes to work with conscientious people backed by ever-increasing stocks of quality specialty steels. The Carpenter Steel Company, 121 W. Bern St., Reading, Pa.

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Spalding 1-2404

Providence, Rhode Island
DExter 1-5769

Rochester, New York
Hillside 2319

St. Louis, Missouri
(currently moving
to larger quarters)

(San Francisco Bay Area)
Belmont, California
Lytell 3-8461

Syracuse, New York
Syracuse 2-0512

Tulsa, Oklahoma
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AnSCO Superay 'A' sets the standards:

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"...Slit to close tolerances"

Frederick E. Kahler
Chief Industrial Engineer
Fedders-Quigan Corp.



fedders



"Our manufacture is basically fast and your slitter permits us to buy steel economically, slit to close tolerances and maintain the other important phases of our manufacturing schedules.

"Congratulations on a well conceived, deftly engineered machine that has proved practically invaluable to us."

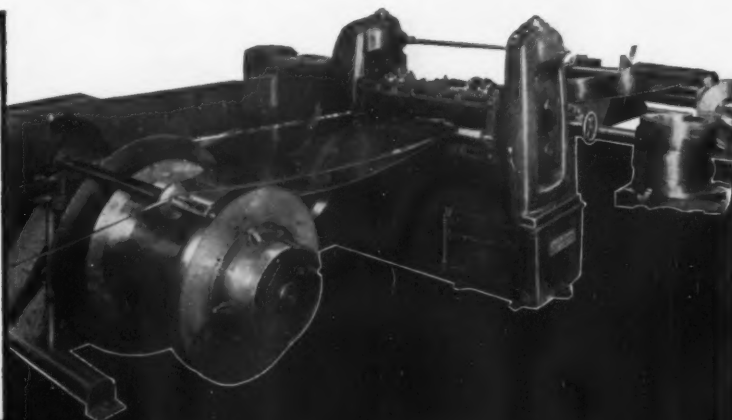
One of the many products of the Fedders-Quigan

Corporation is the famous Fedders Room Air Conditioner, the compact electrical refrigeration system that fits snugly into almost any window and cools, dehumidifies, ventilates, circulates and filters out dust, dirt and pollen. The Kane and Roach equipment at the Fedders-Quigan Plant in Buffalo is used in the manufacture of parts for Fedders Refrigeration Condensers, Electric Water Coolers, Dehumidifiers and Room Air Conditioners.

The K & R Slitting Line pictured is complete with Uncoiler, Slitter, Recoiler and Scrap Recoiler—handles .026 gauge stock in a width of 36" while making up to 25 cuts at a rate of 125' per minute.

It minimizes your coil stock inventory—permits a more efficient and economical operation since you buy stock in mill sizes, at lower mill prices, and slit to exact measurements as needed.

Our engineers will be glad to furnish recommendations, operating data, estimates—no cost or obligation.



**Metal Working Machinery
Since 1887**

Cold Roll Forming Machines
Bending Rolls Straightening Rolls
Slitting Lines Flying Shears & Saws
Special Metalworking Equipment

Kane & Roach

INCORPORATED

SYRACUSE, NEW YORK • ESTABLISHED 1887



WHEN MIGHTHOOD WAS IN FLOWER

From the time of the Pyramids until just recently, heavy construction required "gangs" of men. Today, giant machines supply most of the muscle. In our lifetime, an aggressive construction industry has astounded the nation with its everyday miracles. Steel has played its part by developing better-forming, higher strength steels that have resulted in roads, bridges and buildings that last longer, look better and perform more efficiently. These same steels have also helped make possible the modern tools that dig and pound, lift and haul. An important job at Inland is supplying the *right* steels for building and for the tools of building.

INLAND STEEL COMPANY 38 South Dearborn Street, Chicago 3, Illinois. Sales Offices: Chicago, Milwaukee, St. Paul, Davenport, St. Louis, Kansas City, Indianapolis, Detroit, New York. Steel products supplied to the construction industry include plates, structural shapes, 4-Way safety plate, piling, Ti-Co galvanized sheets, Hi-Bond reinforcing bars, sub-purlins. Other products: hot and cold rolled sheets and strip, tin mill products, rail and track accessories, coal chemicals.



NEWSFRONT

Planemakers See Tool Crisis Coming

Aircraft people see a "producibility barrier" looming ahead because of machine tools. National security demands that the industry turn out faster, tougher-performing planes. Answer lies in using more high-strength superalloys. But industry lacks efficient fabricating, machining techniques for handling such materials; wants builders' help in making tools sturdier, faster, more flexible.

Natural Gas Bill: Back For Debate

Look for bitter battles to flare up in Congress next year over fresh legislation aimed at freeing natural-gas-producer independents from federal price control. Earlier this year, Ike vetoed the Congressionally-approved bill because of "arrogant lobbying." Backers are increasingly confident they'll succeed this trip, though with a less-favorable bill than before.

Copper In Missouri?

Granite City Steel Co. has found copper in Missouri while sinking cores looking for iron ore. Queried by THE IRON AGE, president and board chairman John N. Marshall declined a 'no comment' answer as possibly misleading; said: "We don't know how much copper there is or whether it is high or low grade. We're interested in iron ore. Of course, if we find copper we won't throw it away. But it's not something I would get excited about."

Suez: Ripples Hit Machinery Market

Sparked by Suez, a quiet but intensive buildup in storage-tank orders is underway. Many East Coast fabricators, order books bulging, are scrambling frantically to find extra press brakes, bending rolls, other such equipment. Demand from this quarter has become a major factor in the Eastern used machinery market.

Latest On Cold-Finished Bar

Cold-finished bar producers figure they considerably underestimated consumer inventories. Though they're operating at satisfactory

levels, their feeling is that larger-than-expected consumer inventories are the big roadblock to substantially higher sales. Several users reported last week that if their own sales climb at present rates, they'll be upping their buying of cold-finished bar before year's-end.

Auto Outlook, Sunny and Warmer

Government economists have estimated next year's production and sales levels, and are highly optimistic about the market for '57 automobiles. Adding up manufacturers' figures, they say a 10 to 15 pct sales increase over 1956 (estimated at almost 6 million) is conservative. Possible fly in the ointment, they say, would be too-tight credit levels next year.

Can Ultrasonics Measure Bond Strength?

How can you test strength of adhesive bonds non-destructively? A real puzzler, but one that may be answered soon. A research team presents fairly convincing evidence that bond strength may be measured indirectly by ultrasonic means. Belief is that a definite and reliable relationship exists between signal strength and bond properties.

Chevy Casts Some Aluminum Parts

Chevrolet, using more aluminum in its automatic transmission, has started casting a small percentage of the parts. Indications are it will move further away from purchasing all aluminum parts will step up its aluminum castings activities as time goes on. Entire Turboglide transmission housing is aluminum. Weight saving: some 70 lb.

What's Best Coolant For Bar Machines?

Others can argue that oil cutting fluid's a "must" with automatics: Chrysler's withholding opinion. Its new Kokomo automatic transmission plant is using water-soluble coolants though — and with outstanding success. Part of the secret is fog or mist lubrication methods. Cutting fluid doesn't reach spindle bearings, nor can lubricating oil contaminate the coolant.



Is your part illustrated? These are representative of the shapes that can be cold formed more effectively with Granodraw.

GRANODRAW® PROCESS INCREASES TOOL LIFE 2-5 TIMES IN COLD HEADING STEEL FASTENERS

Thorough research, in cooperation with a leading manufacturer of headed fasteners, has proved the value of Granodraw phosphate coating of stock prior to cold working. Typical of the improvement in tool life and in production are the examples shown in the table.

But the advantages do not stop here in cold heading fasteners or cold working other products. This chemical treatment process permits greater speed of draw; greater reductions within the physical limits of the metal; more passes with the same number of intermediate treatments; and the possibility of fewer process anneals. It also results in less downtime of machines, better surface finish on products, cold forming of more complex shapes, fewer rejects, and a cleaner shop.

Write us for complete information about Granodraw and its application in cold forming operations.

PRODUCTION AND TOOL LIFE

PRODUCT	MATERIAL		AV. PIECES PER DIE DRESSING	
	Tool	Stock	Granodraw-Treated	Other Treatment
3/8 x 3/8 rivet	Hardened Alloy Steel	10 10 Steel	647,000	180,500
5/16 x 24 flat head shoulder bolt	Hardened Alloy Steel	10 10 Steel	26,000	5000-8000
Hex Head Cap Screws	Hardened Alloy Steel	1038 Steel	53,000	13,000-14,000
1/4 x 20 Hex Machine Bolt	Hardened Alloy Steel	10 18 Steel	28,000	13,000

Note. Although investigations on the life of carbide tools are not completed, one item deserves mention. A 5/16 x 24 hex head shoulder bolt showed a strikingly low carbide tool life of 67,000 pieces per die. Using Granodraw-treated rod, one die produced 105,000 pieces—another 194,000 pieces. And both dies were in good condition at the end of the run.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 20, Pa.

DETROIT, MICHIGAN

ST. JOSEPH, MISSOURI

NILES, CALIFORNIA

WINDSOR, ONTARIO





Are Warehouses Steel's Top Customer?

Nine months totals put warehouses in lead . . . Shipments for year will pass 14 million tons . . . Number of warehouses multiplies five times since 1929 . . . Growth problems also multiply.

◆ **THIS YEAR** the warehouse industry could become the largest customer of the steel industry.

It's possible that a late surge of automotive buying for 1957 models could upset the trend. But figures for the first ten months show that warehouses were on top of the customer list.

American Iron & Steel Institute reports that mill shipments to warehouses (excluding oil and gas industry jobbers) totaled 10,615,000 tons, or 18.2 pct, of total shipments for the first nine months.

It is now estimated that total shipments for the year will run over 14 million tons, possibly as high as 16 million tons. The auto industry, in the first nine months, received 10,011,091 tons of steel shipments, and could run ahead on the basis of a last quarter surge.

A Thousand Outlets

Size of the industry continues to mushroom. Keith P. Rindfleisch, sales vice president, U. S. Steel Supply Div. points out:

"There are now at least 1000 full-fledged industrial steel outlets in the U. S. These do not include the hundreds of supply houses that sell a little tool steel or shafting or the fabricators who handle some plain material. We estimate that approximately 200 of the 1000 have opened for business since 1945. At least one-half . . . are in the smaller outlying markets."

One Growth Company

Typical of the rapid growth in the warehouse industry is the opening this week in Hartford,

Conn. of a new branch of Peter A. Frasse & Co. It was just three years ago that the East Coast warehouse firm started a new operation in that city.

Business boomed with such volume that it was only months later that plans for the new 26,000-sq ft facility were being drawn. The new warehouse is three times the size of the earlier building, and Frasse executives have hopes of outgrowing their new home before many more years.

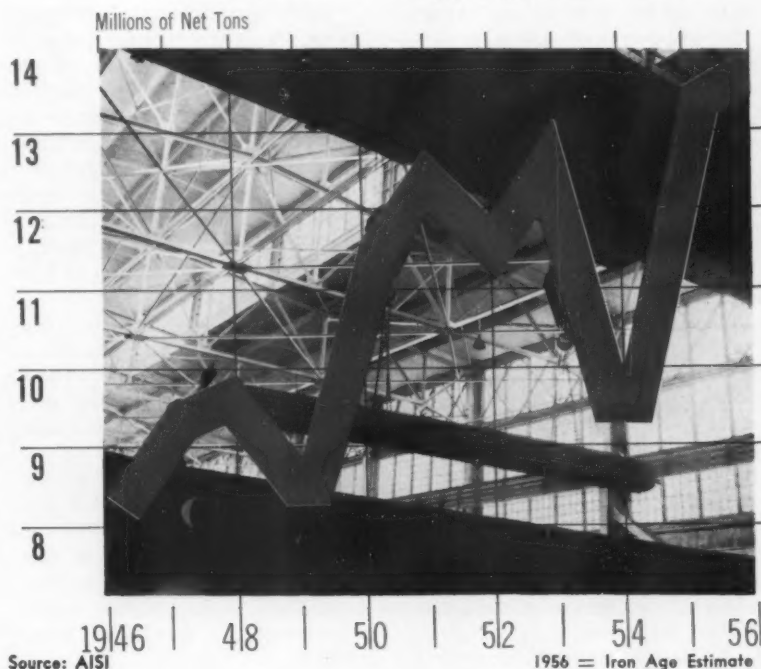
The new building also puts the spotlight on the expansion of metalworking in New England (in addition to Frasse's ability to sell

steel). The area's growth is a matter of record. In Connecticut, the Census Bureau reports value added by manufacture in metalworking rose from \$1,463,544 in 1950 to \$2,113,854 in 1954. State metalworking employment for the period jumped 240,910 to 299,622.

National Picture

Nationally, the 1954 Census of Business released by the Commerce Dept. shows that warehouses have multiplied almost 5 times since 1929. And sales since 1939 have spurted sevenfold. The Business Census shows 2693 establishments at the end of 1954

Warehouses — Shipping a New Record



SPECIAL REPORT

"primarily engaged in distributing basic iron and steel products—with sales of \$2.2 billion."

American Steel Warehouse Assn. membership figures give a good gage of number of the more permanent warehouse firms. The Association has never had a dip in membership in the 20 years of its existence, now counts 514 companies with 862 plants within its ranks.

Size of the industry is also a matter of concern to some. There are frequent claims that too many warehouses are in the picture. This criticism is aimed to a great extent at the "office-in-the-hat" operators who materialize in times of critical shortage.

Money Problems

Numbers are not the industry's only problem. Money is as big if not bigger. Ironically, the warehouses count heavily on metalworking's recognition of the high cost of keeping large stocks of steel on hand. But their own costs are too high to bring adequate return on investment. The record year of 1955 found 81 pct of the industry averaging a return of under 16 pct, with overall profits on sales at 2.5 pct, reports ASWA. And these figures are well below the national average for comparable industries.

Other major money headaches today include steadily rising land and construction costs, too low tax allowances for depreciation and high labor costs. New costing systems and market research and analysis programs are valuable, but cannot solve all of the warehousemen's money problems.

This year's steel labor negotiations brought producers' warehouse divisions under the basic steel wage contracts for the first time. This sets a pattern for the industry, is sure to mean overall higher labor costs in the immediate future.

Depreciation will become even more important as the industry pushes mechanization to offset higher labor and hauling costs. C. L. Hardy, president, Joseph T.



MODERN WAREHOUSES are doing more fabricating, using better equipment to speed service. At U.S. Steel Supply Div.'s St. Louis plant, above, an overhead transfer crane lifts a fabricated section.

Ryerson & Son, reports his firm is researching remote control of cranes by radio. Belt conveyors with push button controls to bring material directly to fabricating or shipping points are also under study. Automatically indexed electrically-powered floor-type conveyers with the route controlled by magnetic tape are also possible. A huge ferris-wheel type rack with push button selector to bring the right steel down to a point of easy removal is also envisioned. And air-powered portable lifters would supplement workers' hands.

Machinery brings its own problems. Most warehouses today offer a considerable variety of cutting and other forming services to the customer. A much-discussed topic among warehousemen is how far they should go in the fabricating business. Some feel that their existing investment in machinery commits them to complementary equipment to minimize downtime.

Others plump for closer adherence to the classic warehouse function of distribution rather than fabrication, fear too great emphasis on processing will bring them into competition with customers. No overall answer holds. Decision rests too much on local conditions and needs. But the long range trend to more fully equipped and mechanized warehouses, requiring higher capital investment, is now well established.

Defense:

Suppliers get break under new Pentagon directive.

Defense-item suppliers who are paid in part while handling their contracts will find military buyers ready to advance them a slightly larger share of the prescribed funds.

A new Pentagon policy permits companies making items requiring six months or longer to produce, and getting part of their financing from the military while the work progresses, to draw more money early in the contract period. These progress payments are to be liquidated eventually, though at slower rate than in the past.

Principle objective of this change is to aid small concerns, but large firms turning out such products as aircraft or ordnance and electronics gear also will find the new policy valuable. Shipbuilders, it is predicted, probably will be unaffected, because their financing arrangements are different.

A Defense Dept. directive, "Defense Contract Financing Policy—Small Business Concerns," describes the revised policy.

From now on, however, as the supplier delivers part of the items called for, a lower amount is to be deducted for liquidation of the progress payments. In effect, the supplier is being paid earlier, and the government takes longer to get its money out.

STEEL: New Life for High-Strength

New markets give fresh strength to high-strength sales . . . Old markets also boom, giving added importance at the mill . . . Output this year should hit 900,000 tons . . . Autos take big share.

♦ **SALES** of high-strength, low-alloy grades are drawing interested glances from steel producers. Shipments of these steels are running about 15 pct over last year. Even with the strike, this year's output is expected to hit 900,000 tons.

In part, these figures reflect busy times in established markets. The railroad industry, for example, is a longtime user of high-strength steels. With freight cars now being built at the booming rate of 6000 a month, shipments of high strength steel to carbuilders are almost double the 1955 rate.

More important is the use of high-strength steels in new areas. Prior to 1953, the Pennsylvania Railroad used copper-bearing steels for the load carrying portions of hopper cars. Today, these parts are high-strength steel. The Pennsylvania RR is also using high-strength steel (with stainless) in the underframe of passenger cars.

Bridge Use Grows

In bridges, this same process is taking place. In all, more than 100 major bridges have been built with the high-strength grades. The growing trend toward these steels in bridge work shows up in shipments to the construction industry.

In 1955, roughly 41,000 tons of high-strength steel went to construction. In the first half of this year, shipments were at an annual rate of 62,000 tons. An increase of 80,000 tons in warehouse receipts also reflects stepped-up erection activity.

Biggest single market for high-strength steel today is the automotive market. Cars and trucks took 330,000 tons of high-strength

in 1955. This year the slump in car production cut into the steel requirements. New models should bring a pickup toward the end of year.

The lag in passenger cars has been offset by gains in trucks. High-strength steels are finding growing use in the underframes of truck trailers and they are being used in the beds of light trucks. Producers point to the increased payloads that high-strength affords a trucker. They regard this field as one of the most promising for these high-strength steels.

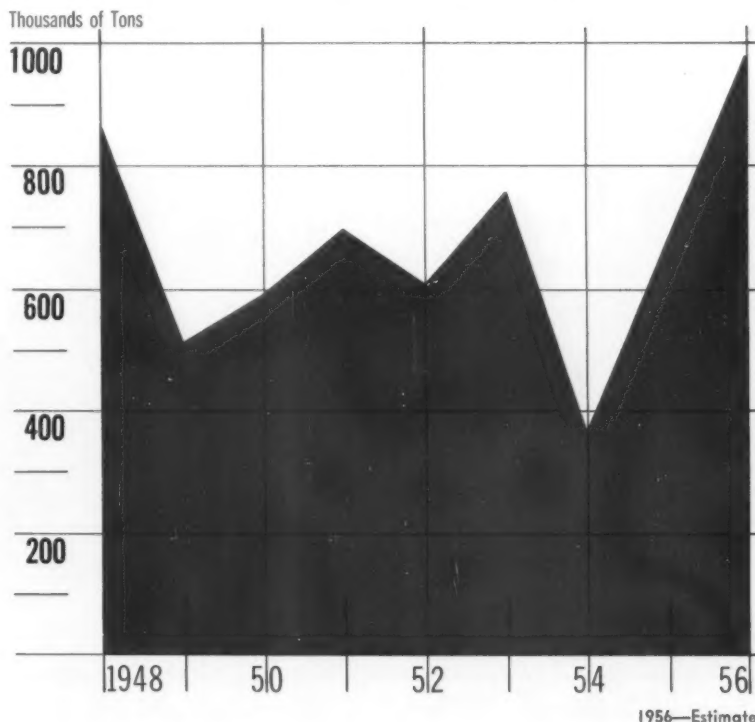
Taken together, the truck-car field showed first half shipments

at an annual rate of 400,000 tons, or 60,000 tons over the previous year.

Construction machinery took 35,000 tons of high-strength steel in 1955; this year first half shipments were at an annual rate of 46,000 tons. The weight savings afforded by high-strength steels are bringing wide use in buckets, scraper blades and other moving parts.

Producers say all this sales activity indicates growing recognition and familiarity with high-strength steels on the part of designers. Allowable working unit stress of 27,000 psi for high-strength steel compares with 18,000 psi for a carbon steel.

High-Strength Shipments Grow



THE SOUTH: It's Ready and Waiting

Markets and labor are there for basic industry . . . Pattern of steel sales changes with new markets . . . Aluminum puts new emphasis on southern plants . . . Labor still plentiful—By G. J. McManus.

◆ IS THE New South a market mirage—or is it a solid foundation for an expanding metalworking industry?

The area continues to attract new industry on the basis of abundant basic materials and ample labor, favorable tax and labor laws, mild climate, pleasant living conditions and growing markets.

The South is changing fast. Industrial employment has risen by more than 200,000 since 1947. Over \$1 billion went into expansion of Southern industry last year alone. Value added by manufacture each year is up \$3 billion over 1947.

Has this activity taken the edge off the South's charms? The answer seems to be no: Recent in-

dustrial growth has barely dented the area's potential. Certain artificial advantages are disappearing as development progresses, but they are more than offset by new assets and by basic resources.

This does not mean the area has no problems. On the question of basic materials, observers say the South now has a steel deficit of from two to three million tons a year. Backing this view is the fact that Southern mills operated 10 to 20 pct over the national average during the 1954 slump. And when the nationwide market for cold-rolled sheet went over last spring, producers turned to the South with their overflow.

Southern mills are expanding rapidly to meet new needs. Since

1946 they have increased capacity 70 pct. Tennessee Coal & Iron Div. of United States Steel Corp. has increased capacity from 2½ to 4 million tons a year.

Republic Steel Corp. at Gadsden, Ala. is currently putting in an electric furnace with a capacity of 294,000 ingot tons a year. Republic is adding a hot strip mill, a tandem cold mill and a continuous galvanizing line at the same location.

Meeting Quality

Atlantic Steel in Atlanta has just put in an \$8.5 million merchant bar and rod mill. Atlantic has two new electric furnaces in operation, is giving serious consideration to continuous casting as a means of rounding out modernized facilities.

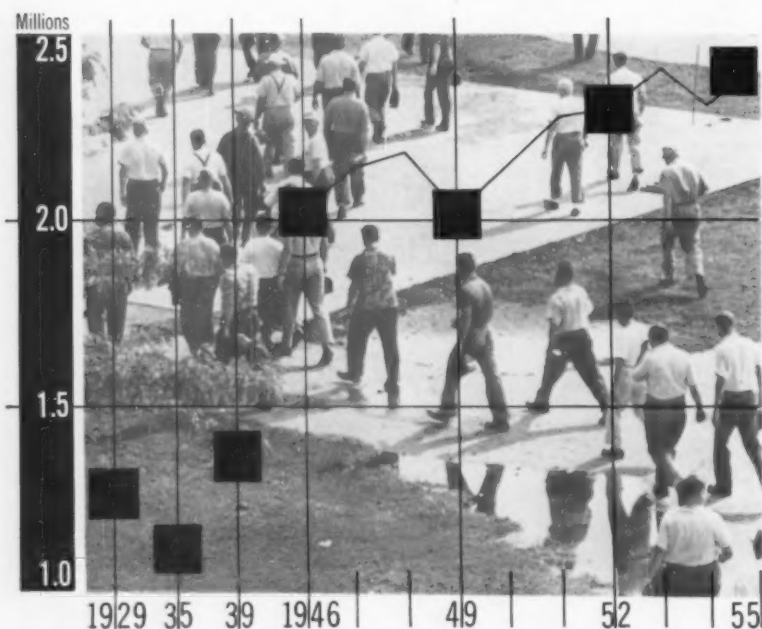
In Birmingham, Connors Steel is winding up two expansion and modernization programs of \$2.5 million each. Connors has added electric furnace and finishing capacity.

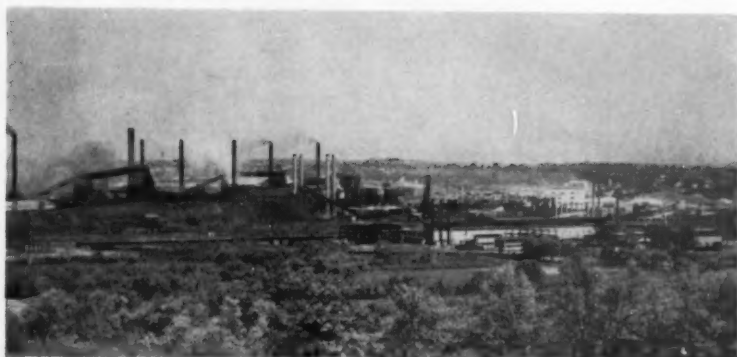
In addition to the question of quantity, Southern steelmakers are meeting new quality requirements. Traditionally, the South has provided a market for hot-rolled carbon steels. No stainless was made there; very little alloy steel was sold.

This picture is changing. Westinghouse Electric Corp. and General Electric have built up extensive manufacturing establishments in the South. Ford Motor Co., with its new Sheffield, Ala., plant, becomes the first big carmaker to locate a basic manufacturing facility in the deep South. The trend is away from light metals and small shops toward mass production and precision manufacture.

In response to this need, south-

It's Not All Cotton and Tobacco Southeastern Factory Employment Climbs





MORE THAN 100 products and byproducts of steel are produced at U.S. Steel's huge Tennessee Coal and Iron Div. mill at Fairfield, Ala. A coil of strip, below, is marked at TCI's raw coil storage dept. prior to conversion to sheet or tin plate.

ern steel mills are upgrading their metals. Basic producers are blending Alabama ore with select Libe-rian grades. The mills and their customers are looking for steels that will take deep drawing and severe machine forming.

In line with this same trend, Republic at Gadsden is adding facilities that will turn out 6000 tons of cold-rolled sheet a month. At Birmingham, Connors Steel has become the first integrated producer in the South to offer cold finished bars.

These things represent the beginning rather than the completion of a southern swing. Galvanized sheets for the farm market are still important; new Republic facilities will turn out 10,000 tons of galvanized a month. Leaving out the oil field requirement, structurals and plate make up the heaviest tonnages consumed in the South. Wire is next; then hot-rolled bars and hot-rolled sheets. A high percentage of southern steel is still sold through warehouses to smaller users.

Here Comes Aluminum

Competition from the Japanese for export scrap and from importers with the merchant wire are among the worries of Southern steelmakers. The scrap problem is particularly serious. A high percentage of the region's steel goes into oil wells and yields little scrap return.

Aluminum producers are feeling the growth of the southern market. TVA is a heavy buyer;

aluminum fabrication has grown like wildfire in Florida. One producer says the South takes 7 pct of its shipments today as against 5 pct in 1946.

There has been a great expansion of aluminum production in



the South, particularly with regard to reduction facilities. Olin Revere Metals Corp. has a \$50 million alumina plant going up at Burnside, La. Kaiser Aluminum & Chemical Corp. is putting \$60 million into a Gramercy, La., plant.

Expenditures announced by Aluminum Co. of America over the past two years have included: \$10 million at Mobile, Ala.; \$4 million, \$2.5 million and \$6 million at Alcoa, Tenn.

Reynolds Metals Co. is spending \$24 million on expansion of its Lister Hill, Ala., reduction plant

and sheet mill. At the same location, Reynolds is adding a second plant with 200 million lb capacity.

Plenty of Labor

Labor for southern plants is coming in large part from the farm. Feeling of employers with experience both in the North and the South is that these men have made good production workers. "They don't seem to hurry," says one Connecticut-born foreman, "but they get the work out."

In the matter of skills, the South is gradually building up a pool of experienced workers. In 1940 the area's work force lined up like this: 26 pct laborers, 55 pct operatives and 15 pct craftsmen. In 1950, this had changed to: 17 pct laborers, 64 pct operatives and 16 pct craftsmen.

Companies moving into the South will generally bring along a skeleton force of key men. The remainder of the work force is recruited locally.

Wage Pattern Changes

Manufacturing wages are lower in the South than in the United States as a whole.

In part, the South's low wage averages are the result of an unusually high percentage of workers in industries that are low-paying everywhere. Twenty-eight percent of the South's manufacturing employment is in textiles, while only 7 pct of U. S. employment is in this industry. This percentage is changing as chemical, rubber and other high-paying industries are growing faster in the South than textiles and lumber.

But this picture is changing; southern steelworkers receive the same wages as northern. Manufacturing wages and salaries have increased 71 pct in the South since World War II while nationwide pay has gone up 66 pct. Local development groups say companies should not come South just to seek cheap labor. The area is fast putting wages on an equal footing with the rest of the country.

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METAL WALLS: Get Architects' Backing

About 50 pct of all new construction in the U.S. calls for metal curtain walls . . . Use growing in outlying industrial districts . . . U.S. Steel claims first all-stainless-clad building . . . Weight savings cited.

♦ AN OVERLOOKED side of architectural metals moved into the spotlight recently when United States Steel Corp. dedicated its new office building at Munhall, Pa.

The building makes extensive use of stainless steel curtain walls. It points up the strides that metal curtain walls are taking throughout the country.

Use of metal walls in city skyscrapers has been widely publicized. What may not be so well known is that outlying construction for industry, institutions, and commercial activity provides more active and significant market for architectural metals. It's estimated that curtain walls are being employed in 50 pct of all new U. S. construction.

U. S. Steel says of its building that it is the "first true stainless curtain wall construction ever to be undertaken." Over 1000 all-steel panels have gone into the five-story structure. Panels have stainless steel (or porcelain enamel) on the exterior, carbon



SAVINGS in time and cost are advantages of stainless steel curtain wall construction at U. S. Steel's Homestead works general office building.

steel inside and a layer of fibrous glass insulation sandwiched in between.

No finishing or backup material is applied inside the panel; it forms the complete wall. In this respect, the Munhall construction

differs from what is often called curtain wall architecture. The metal facings employed on modern skyscrapers will generally be backed by some type of masonry.

One reason for this difference is the rigid building codes of many larger cities. These will specify that so many inches of masonry must be provided for fire protection. The masonry must be there even though a metal panel alone might be built to withstand specified temperatures.

Metal producers are trying to have old building codes changed from a material to a performance basis. In this they are bucking long-standing traditions and associations. A test case in an eastern city is up for decision.

Importance of code revisions lies in the space and weight advantages of metal curtain walls. Even with a 4-in. block backup, the aluminum (Alcoa) exterior of the 261 Madison Ave. building gives a weight saving of more than

Stainless and Heat Resisting Steels

In Construction and Contractors Products

(Net Tons)

1956	26,500*
1955	21,566
1954	14,396
1953	18,752
1952	16,607
1951	24,336

*Mill shipments direct to fabricators. Warehouse shipments raise total to 57,000 tons.

STAINLESS steel used in construction keeps pace with growing use of metal walls in new buildings.



40 lb. per square foot over conventional walls.

In the U. S. Steel building at Munhall, total wall thickness is 3 in. This compares with 9 to 12 in. for conventional walls. And in a 20-story building, measuring 100 ft by 200 ft., a six inch reduction in wall thickness means \$36,000 a year in added rental space.

Steel Problems

While city codes are not choking development, fullest use of metal curtain walls is being made in areas removed from older building centers. Ford Motor Company's 14-story office building at Dearborn, Mich., employs panels made of 16 gage porcelain enamel steel on the outside, painted steel inside and a honeycomb core with 2 in. of foam glass in the middle.

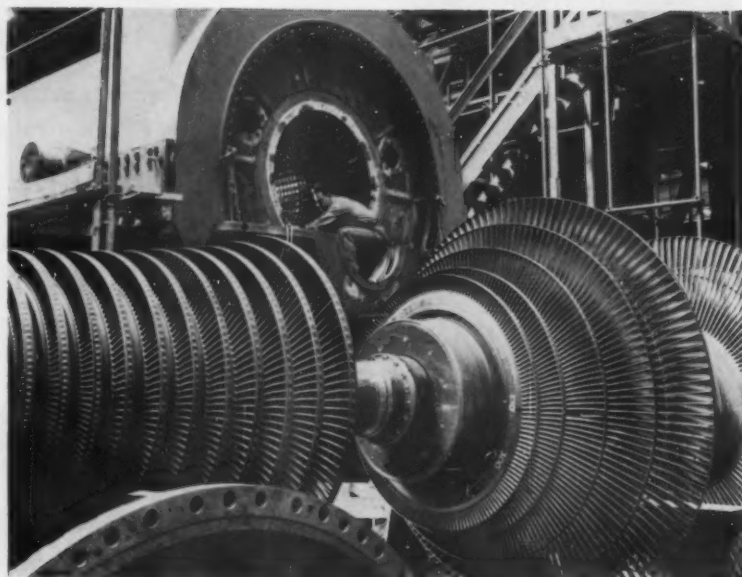


WORKMEN at Alcoa's heavy press plant at Cleveland, prepare insulation in installing sandwich type wall.

The steel industry has its problems. In the aluminum field, building products account for about 20 pct of all shipments; architecture provides the largest single market. For this reason the big aluminum producers have turned their biggest guns on the field.

The steel situation is different. In 1955, contractors' products and construction work took 22,000 tons of stainless steel. Even with a generous allowance for warehouse shipments, this amounts to only 6 pct of total stainless shipments and a tiny fraction of all steel shipped. Steelmakers are interested in the architectural field but they are spread pretty thin by bigger markets.

MANUFACTURING



TYPICAL of large turbines is this 100,000 kw turbine-generator set for the Public Service Electric and Gas Co. It is assembled here for test at General Electric's Schenectady plant. It will stretch 85 ft in length.

STEAM ENGINES: Backlogs Grow

Makers will gross \$800 million in shipments this year . . . Emphasis is on larger units, but these must still pass the test of performance . . . Sales mount.

♦ **STEAM ENGINES** and turbines are getting bigger. And so are the price tags.

As a result, manufacturers will take in about \$800 million in sales this year, a fat increase from the \$450 million in shipments in 1954 and the \$585 million in 1955.

Manufacturers are even more encouraged about the rate of incoming orders. Backlogs extend through 1957 and rate of new business assures prosperity for the industry through the next few years.

Today, there is new emphasis on size. Westinghouse Electric Corp. has a 325,000 kw unit under construction. And there are several 300,000 kw units under construction or being put into operation.

In spite of the apparent pros-

perity, the field is highly competitive. The cost of the larger units is such that the loss of one order can make the difference between a good or mediocre year for a producer.

Need Proof

It will take two years to prove out the large units which now attract the most attention. Cost per hp is higher and added economy and efficiency is still on paper. Performance is still to be proved by operation.

Despite the unusual dollar value increase, employment is up only about 8000 men since 1947. Greater percentage of skilled labor accounts for the comparatively small increase in employment.

TOYS: Metals Dominate The Market

Metal toys account for 30 pct of total sales . . . Plastics in second place . . . Retail sales run \$1.4 billion, up 12 pct over 1955 . . . But business is hotly-competitive . . . Imports are rising—By G. G. Carr.

♦ **METAL'S SHARE** of the toy dollar goes up in relation to the price tag.

At 25 cents and under, metal toys account for 8 pct of sales; at \$10 or more, 68 pct. At the average toy price of \$3.18, metal toys ring up 39 pct of the sales dollar.

Probably due to greater wear and tear, metal gets its biggest play in toys for boys. Girls' toys at almost all ages are made from paper, cardboard, or plastic. For two-year-olds, metal plays a minor role, but both boys and girls from 2 to 6 usually are given metal toys.

The express wagon set seems to be giving the stuffed animal bit a particularly big play this year, but metal toys still dominate the field. For all age groups, metal toys account for 30 pct of the total, far and away the biggest group. Closest competitors are the plastics, with 18 pct; thereafter in descending order, paper or cardboard, 17 pct; wood, 10 pct; rubber, 9 pct; cloth, 6 pct; miscellaneous, 10 pct.

Expansion Sure

But whether toys are made from metal or other materials, the market seems destined to expand far into the future. With four million babies added to the population each year, pre-school age sales are up 18 to 20 pct. Times are good, and disposable income at an all-time high. Even better, the child population is slated to spurt to 53.9 million by 1957, compared with 48.5 million today.

But before you decide you are in the wrong business, consider these headaches:

1. The business is still very seasonal.



END USERS of most metal toys are boys from age two and up, like this pair playing with trains and erector set. (A. C. Gilbert Photo)

2. Toys are hotly-competitive, very sensitive to fluctuations in the economy and to materials supply.

3. Much of the labor is skilled, hard to hold in slack months.

4. Toys are wanted by children, but bought by adults.

5. Imports, while still low, are rising.

Finally, the problem of design. Toys must be durable, of good quality, made of non-toxic materials, with play or educational value, attractive, appropriate to the child's age group and appealing to both parents and child. It's not easy.

But it's a mighty big business anyway you look at it. Retail sales are running at an annual rate of \$1.4 billion, up a healthy 12 pct over last year.

The toy trade holds its breath in fourth quarter. For despite the industry's best efforts to spread out toy buying, the overwhelming volume of toy sales are made in October, November and December. In the last 3 months of the year, 78 pct of all U. S. families, some 33 million, buy toys to pop junior's eyes on Christmas morning.

That well-known phantom, the average family, spends \$28 during the last quarter for about 9 toys, for 3 or 4 children. Two-thirds of the toys are given to small fry in the immediate family group. The average kid gets six toys at Christmas. Of his loot, four come from mom and dad, other close relatives, two from family friends and more distant relatives.

The nursery set, 2 to 6 years, accounts for 36 pct of the child population, gets 50 pct of all toys.



Kaiser Steel Corp. photo

RECREATION: Costs Industry \$800 Million

Employees, however, have a share in financing, as well as organizing programs . . . Trend is toward broader, more diverse schedules . . . There's greater emphasis on family events and inter-departmental competition.

♦ "BUSINESS will be judged by how it serves the hungry body . . . but the final judgment will be on how well it serves the larger area of the human spirit."

That's the way General Electric Co.'s Joseph M. Bertotti, Public and Employee Relations Manager, Research Service, sees industrial recreation's meaning to management. And that it's accepted thinking is borne out by the \$800 million—an average of \$5 per worker—which industry spends each year on employee recreation.

An increasing number of companies, the National Industrial

Recreation Assn. reports, are adapting full-time programs and directors, expanding facilities, and enlarging budget appropriations.

More Variety

Other trends in company-sponsored recreation are broader and more diversified programs, a greater emphasis on family activities, special programs of travel and entertainment, increased events planned for women employees and a shift from varsity to inter-departmental athletic competition.

Kaiser Steel operates its Recreation Club on plant vending ma-

chine receipts which amount to \$18,000 a year. In addition the company has laid out \$250,000 for equipment, with additional funds supplied for staff salaries.

On a 40-acre tract, the company has built a gymnasium-auditorium, a club house, two softball diamonds with lights and bleachers, a picnic area with tables, barbecue pits and children's playground equipment.

"The benefits to management," says Director of Personnel Services Vern F. Peak, "are better employee relations. The feeling that management is interested in the employee and his family certainly contributes to this closer relationship."

Activities of the Inland Steel Athletic Assn. are financed by commissions paid on in-plant vending and through \$1.00 per year membership dues paid by each of the group's 9000 employee members.

Twenty-seven pct of the employees at Continental Steel Corp. take part in at least one of the firm's programs. Duties of a plant council include drawing up appropriation requests and promoting the various sponsored activities. Vending machine profits are also used at Continental to help pay the costs of the recreation program.

Who Pays the Recreation Piper?

■ The National Industrial Recreation Assn. states that three-fourths of company-sponsored programs are administered by the employees themselves through athletic or welfare associations on a voluntary membership plan.

■ Approximately 50 pct of the companies with programs have a full-time or part-time recreation director. Sixty-four per cent of the directors report to the head of the personnel department.

■ Vending machine profits are used by 43 pct of companies as the source of recreation funds. Club dues are listed by 42 pct. Less than 11 pct of reporting firms indicate they finance the entire program. In most cases management matches employee assn. dues.

COMBUSTION ENGINES: At Full Throttle

Nation's demand for power sparks engine output . . . Backlog of orders means good business through 1957 . . . Oil drilling, stationary units and electricity generating mean more engine sales.

♦ THE NATIONAL appetite for power, particularly electric, is still increasing. And the internal combustion engine industry is being carried along with it.

Every signpost indicates further increases in demand for stationary power units, traction engines, and electric generating sets. Oil men, in particular, are talking of gains in their drilling requirements at least through 1960.

The internal combustion engine industry, by almost every yardstick, is a growth industry. Dollar values of shipments advanced to \$891 million in 1954, for a 21 pct gain over 1947, in current dollars. Consolidation of manufacturing and increased mechaniza-

tion has cut employment from 65,500 in 1947 to 51,800 in 1954. At the same time wages advanced 11 pct—\$206.9 million in 1947 to \$241 million in 1954.

Costs Up

It boils down to an 11 pct wage gain offset by a 21 pct drop in employment. But even this would not be enough to take the industry out of the woods. It's figured that in the seven year period, costs have advanced 56 pct as compared with a 31 pct increase in value added by manufacture.

Among other points worth noting is a change in the geographical pattern of the industry. Combustion engine firms in the Michi-

gan area have grown extremely strong—by 50 pct gain—and Illinois has shown a 125 pct gain. The northeast and Ohio areas have fallen off slightly. Thus fewer firms, less widely scattered, are putting up with higher costs but are getting a bigger percentage of a rising overall market.

Three Big Types

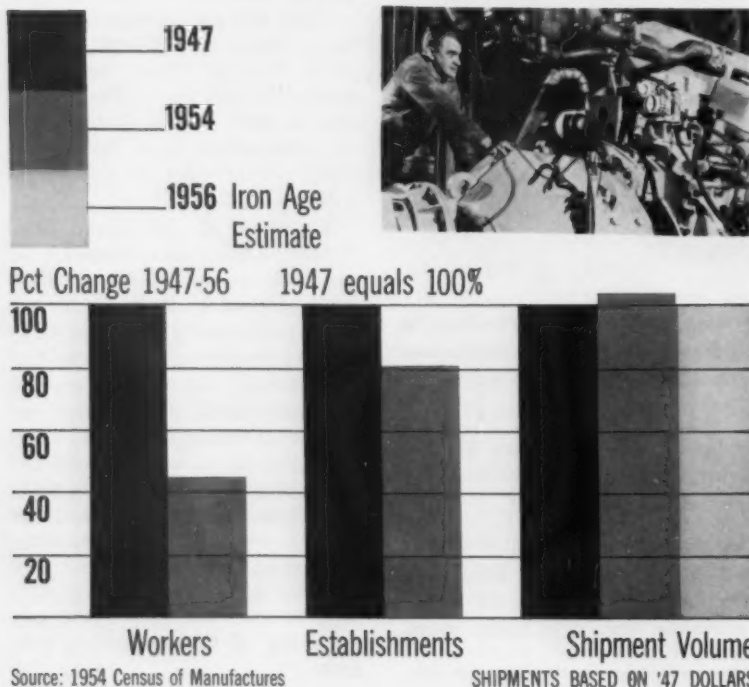
Generally, the industrial combustion engine industry, as defined by the Dept. of Commerce, leans heavily to diesel and semi-diesel engines, with non-automotive gasoline engines in the number two spot. These three engine types command the bulk of the market and have advanced 115 pct over the 1947-1954 census period. Gas engines other than turbines and outboard engines have developed into a galloping market that is attracting new production capacity for the industry.

Gas Engines

Outboards advanced 152 pct and give every indication of continuing to climb—both in number of units marketed and in price per engine as the buyer demands more horsepower and auxiliary equipment. Gas engines, excluding turbines, rose from \$18,092,000 in shipments (1947) to \$25,993,000 (1954) for a 139 pct rise, in current dollars.

The last seven years haven't been easy, but the internal combustion engine builder is a strong market prospect for the years immediately ahead.

Market Steady for Combustion Engines



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PLANNING: Illinois "Pinpoints" Sites

State's effort to attract new industry is leader in joint city-state planning . . . Communities are listed with availability of facilities . . . But some problems remain to be solved.

♦ "OPERATION PINPOINT" is an added twist in the heated race by states to lure new industrial development within their borders. Take the Illinois plan, for example.

It's a joint state-municipal effort. Here's how it will work: A state government appropriation, along with money advanced by interested communities, will be combined for the necessary public-relations job. Each town will be listed.

What's Available

In one phase of the program, ads will list communities which have elected to join the plan, give footage or acreage available for manufacturing use, list new plant sites—generally give a thumbnail sketch of exactly what communities are soliciting new business and what each is willing to offer.

The Illinois plan calls for buying of options on potential plant sites by local business groups, guaranteeing the buyer against a skyrocketing land price.

In a third phase, the Illinois plan will rely on a state "Division of Industrial Planning & Development" at Governor's staff level. This group is conducting a survey of available sites, population, manufacturing space, space available for new building, and transportation.

Work To Be Done

The triple-pronged plan is probably the first to use cooperative action by state and municipal governments, with both groups dovetailing funds.

At the same time, it is putting more detailed information into the hands of industrialists.

Some questions that still must be answered if programs such as that of Illinois are to succeed:

1. What's the tax outlook, not now but in the foreseeable future? A debt-burdened government, local or state, forecasts tax increases.

2. What are the political aspects? Is zoning necessary, has it been done, can it be done?

3. How extensive is the labor pool? One major corporation won't move into a town in which more than 50 pct of the population is already engaged in manufacturing work. From its standpoint, it is saturated. Another will not move into a community in which its own workforce would require more than 15 pct of available labor.

4. Assuming transport is available, what about freight rate costs? Obvious, but one plant was bought before the freight department was consulted and had to be resold.

5. In moving to new market areas, what is happening to raw material transport costs?

6. What are the state laws regarding new water sources if the present supply becomes inadequate?

These are criteria used by most major corporations before seriously considering a moving job. The Illinois plan is a beginning. Other states may well follow.

Expansion Briefs

Crucible Steel Co., Pittsburgh; a \$25 million equipment replacement and plant modernization project in addition to a \$20 million program now under way.

Fansteel Metallurgical Corp., North Chicago, Ill.; awarded a \$6.5 million contract to Dickman-Pickens-Bond Construction Co. for a tantalum-columbium plant near Muskogee, Okla.

Granite City Steel Co., St. Louis; expects to increase capacity another 30 pct by 1958.

Lake Superior & Ishpeming Railroad; asked the ICC for permission to borrow \$5 million for new ore docks on Lake Michigan; plans to spend \$2.4 million more for equipment to move ore from northern Michigan to the docks.

The Trane Co., LaCrosse, Wisc.; installing a new compressor production line which will increase capacity by 100 pct, as part of a \$13 million expansion; full operation scheduled for Jan. 1, 1957.

New Link-Belt Plant

Link-Belt Co. is planning a new plant in Montebello, Calif., that will more than double the company's West Coast capacity.

The 90,000 sq ft building will be situated on a 25-acre tract. Ground will be broken in the spring and the plant will be completed November, 1957, according to Robert C. Becherer, president.

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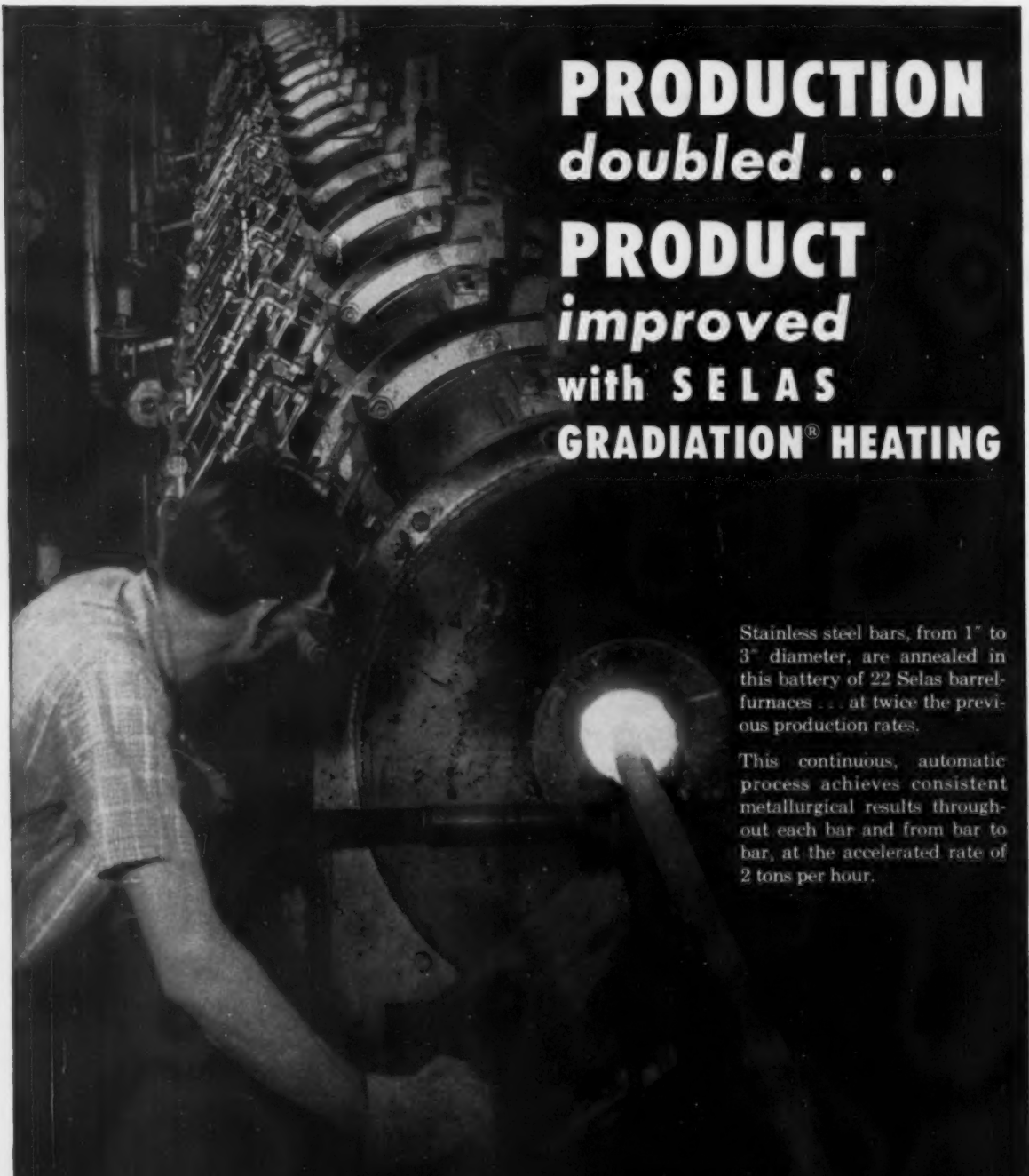
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REPORT TO MANAGEMENT

Here Comes Taft-Hartley

It wasn't just campaign talk when the Administration, chiefly through Secretary of Labor James Mitchell, promised to push for amendment of Taft-Hartley. Now it intends to deliver, if at all possible.

The Secretary of Labor worked hard to get the confidence of labor. To some extent he succeeded. Today most labor leaders believe he means well (from their point of view), although they still tend to distrust anything with the GOP label.

It's no secret, for example, that Mr. Mitchell and David McDonald, head of the United Steelworkers, enjoy a close rapport. Within the Administration, he pushes strongly for labor points. Amendment of T-H is high on his list.

It Starts Here

As a first step for amendment, he is attempting to get recommendations from a construction industry joint labor-management committee.

This is more difficult than it sounds. President Eisenhower has advanced several proposals favored by the building trades in previous sessions of Congress. All were bitterly opposed by the construction industry and failed to get anywhere.

Sec. Mitchell has not yet decided whether to establish similar labor-management committees for other industries to advise him on T-H amendments. He will present his recommendations to the White House early next year.

What Are the Odds?

It will be difficult even for Ike to get T-H amendments through Congress. This is in spite of the fact that Democrats are in majority in

both houses. After all, the same situation existed in the past two years.

T-H is a tough old nut to crack. One reason is that Southern Democrats control committees. In the House, Rep. Graham Barden, N. C., is bitterly opposed to weakening the law. The Senate is less inclined that way, may report out a bill, even pass it.

Labor will also push all-out for repeal of the measure (Sec. 14-B) that permits states to pass their own right-to-work laws. But it's doubtful if this controversial measure will go, even if other amendments do.

Here again, Mr. Mitchell sides with labor. He has indicated, although in extremely careful language that could permit him an out, that he opposes right-to-work laws. Whether he can make this an Administration recommendation is another question.

Down on the Farm

If your company does business with the farmers, directly as an implement manufacturer or indirectly as a supplier, the Dept. of Agriculture has some encouragement.

Farm prices and income are both due to go up in 1957. This means, obviously, that the continued downturn of the farm implement market may be at an end.

But on the gloomy side, much of this effect will be dissipated by higher costs of farming. In other words, farm labor and materials such as feed and machinery will go up in price.

On the other hand, soil bank measures and smaller acreage allotments will cut into the actual amount of acreage that will be farmed. This would give the farmer a break, but not necessarily stimulate machinery purchases.

INDUSTRIAL BRIEFS

Radioactive Myopia . . . A remote-controlled microscope has been developed at the Hanford plutonium plant of General Electric Co., Richland, Wash. The device inspects materials emitting radiation so intense that its optics eventually go "blind." It is used to study changes occurring in the microstructure of metals exposed to chain-reaction bombardment. The information gained is used to develop alloys and fabrication methods that will make atomic structures withstand increased radiation exposure.

Globe Girdling . . . The Martin Co., Baltimore, has formed the Martin International which will operate as a wholly owned subsidiary company. It will explore and develop world markets for nuclear powered electrical generating systems.

Tolstoy to T-Square . . . A scholarship to permit liberal arts students to acquire an engineering education has been established at Illinois Institute of Technology. The full tuition grant, initiated by International Nickel Co., Inc., N. Y., will become available for the fall semester of the 1957-58 year. The award also provides \$300 for books and living expenses. It is renewable.

Speer In High Gear . . . A research and development laboratory for Speer Carbon Co. is under construction at Niagara Falls, N. Y. Andrew Kaul III, Speer president, officially broke ground for the new research facility which is scheduled for completion in the fall of 1957.

Firth First . . . Firth Sterling Inc. has released a new carbide grade, Firthite NHA, recommended for machining cast iron, aluminum, brass and plastics.

Under New Management . . . The Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. has acquired the Sendzimir Cold Rolling Mill interests of The Armzen Co. Waterbury Farrel will operate its purchase as the Sendzimir Mill Division. Present Armzen Co. personnel will remain to handle sales, engineering, and servicing of Sendzimir cold sheet and strip mills.

Another Notch . . . Link-Belt Co. has acquired the Detroit Power Screwdriver Co., manufacturer of power-driven screwdrivers and related automated assembly equipment. Link-Belt exchanged 20,020 shares of its common stock for all of Detroit Power Screwdriver stock. Ratio was 2½ Link shares for each Detroit Power share.

\$4-Million for Scotch . . . Cummins Engine Co., Inc., Columbus, Ind. will build a plant for the manufacture of Cummins Diesel engines at Shotts, Lanarkshire, Scotland. Cummins Engine Co., Ltd. will be a wholly owned subsidiary of the Indiana firm. Officials at Cummins estimate the total investment at Shotts will approximate \$4 million during the next two years for machinery, tools, fixtures, dies, materials and equipment.

Lithium Funnel . . . The American Lithium Institute, Inc., has been established to conduct research on lithium and its compounds. The non-profit organization will maintain offices in Princeton, N. J. A technical library and literature service will be available at this office. The institution will also act as an agency for the correlation and dissemination of technical information on lithium.

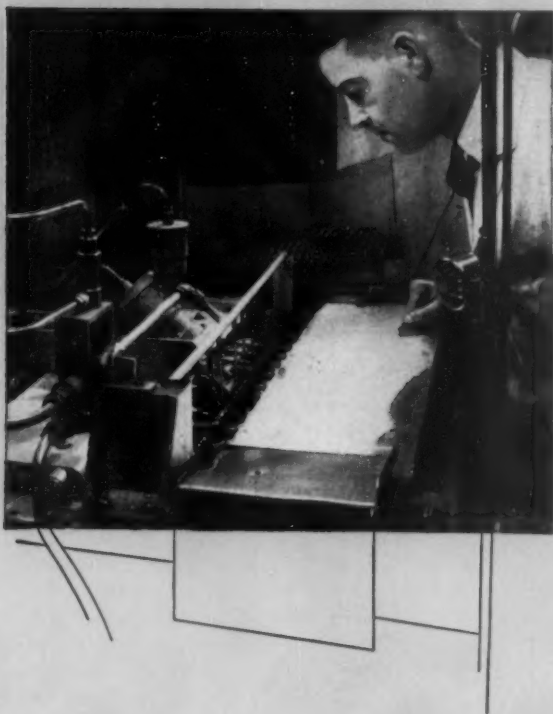
Two to One . . . Koehring Co. and Buffalo-Springfield Roller Co., construction machinery manufacturers, will merge. It will be accomplished through the exchange of an undisclosed amount of Koehring common and preferred stock for all capital stock of Buffalo-Springfield. On Dec. 1st, the merger will become effective, with Koehring the surviving corporation.

Electronic Undergrad . . . International Business Machines Corp. will establish a university computer on the campus of the University of California at Los Angeles. The Western Data Processing Center will be devoted to the study of complicated business management problems. This is a multi-million dollar gift from IBM including the use of a 705 electronic data processing machine and a giant digital computer.



" . . . Excellent working conditions—paid vacations, hospitalization, sick leave, paid holidays, and eight bachelors . . . "

'dag' dispersions... a touch does so much!



Tool-life increased 60 times

In an unusual multiple-spindle drilling operation, a machine-tool firm found that straight cutting-oil did not give satisfactory performance. Drills constantly had to be resharpened after sinking about 50 holes.

However, when a 1:300 dilution of a 'dag' dispersion of colloidal molybdenum disulfide in oil was tried, tool life before resharpening was extended to 3,000 holes!

This result is typical of the production improvements which can be realized through the use of this outstanding new high-pressure lubricant. Whatever your machining operation, it is likely that molybdenum disulfide can help. And Acheson Colloids' service engineers can give you the benefit of their experience in its application. Why not get in touch with your nearby Acheson representative? Meanwhile, write for your free copy of Bulletin No. 424.



ACHESON COLLOIDS COMPANY

PORT HURON, MICHIGAN

... also Acheson Colloids Ltd., London, England

ACHESON COLLOIDAL DISPERSIONS:
Graphite • Molybdenum Disulfide • Zinc Oxide
Mica and other solids

'dag' is a registered trademark of Acheson Industries, Inc.



Acheson Colloids Company, Dept. D-118
Port Huron, Michigan

Yes, I want to get your free catalog on 'dag' dispersions for use in Industrial Lubricants.

Name

Title

Company

Address

City Zone State



Edsel Aims To Fill Gap In Ford Line

The new model will allow Mercury owners to step up modestly yet stay in the Ford family . . . Edsel Div. hopes to capture 3.5 pct of the total market in 1958 . . . Tooling planned for 1959—By T. L. Carry.

♦ FORD MOTOR CO.'S entrance into the medium price car market with a new product emphasizes a trend in car buying that has developed in recent years.

The majority of cars sold today, whether they are Fords, Plymouths, Mercurys or Oldsmobiles, all have one thing in common. They cost pretty much the same. Low priced cars, with optional equipment added on, cost as much or more than the cheaper models of medium priced cars. Price overlaps are getting longer.

Marketing practices and public buying habits have changed so much in the last few years that

it is almost impossible to draw a line between price classes.

The Missing Rung . . . A new area has been developed due to the auto industry's practice of making luxury features available on just about every car. So much so that the low and medium price ranges are so similar that it is hard to tell them apart.

Yet, at least 60 pct of all automotive sales fall into this category.

Previously, Ford Motor Co. has not been able to compete equally in this market. A customer could very well "step up" from a Ford

to a Mercury, but after that there was no place to go. Compared to Chrysler and General Motors, Ford didn't have a product to keep a Ford owner in the Ford family.

That is the main reason for the Edsel, which Ford has named the new car it will introduce to the public in the fall of 1957.

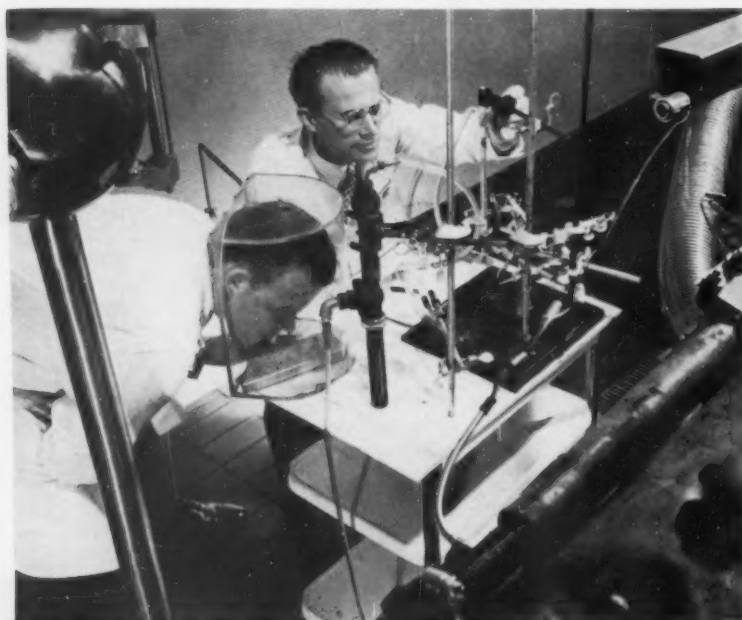
Interrupted Plans . . . The company doesn't say so specifically, but it is generally agreed that the new car will fall between the Mercury and the Lincoln price-wise. Thus, Ford will be in a better position to keep Ford owners from switching to Buicks, Oldsmobiles and DeSotos.

Work on the Edsel was started before the company formed its Special Products Div. in April of 1955. As long ago as 1948, Ford considered the possibility of bringing out a new car, but the Korean war interrupted plans.

Planning was revived shortly before the Special Products Div. was formed and work began in earnest in May of 1955.

Altogether, the Edsel Div. estimates that it will spend \$250 million to bring out the new car. This includes money for organization, facilities and at least \$40 million for tools.

Ambitious Targets . . . R. E. Krafve, general manager of the new division, says that it will employ at least 15,000 new workers. Plans call for the cars to be assembled in plants already in use. It is believed the car will be assembled on the same basis that General Motors runs its B-O-P



NOSE TEST. A General Motors research engineer, left, pokes his head into a "sniff box" for studying diesel exhaust gas odor. No device known can measure odors better than the human nose.

"Running this CUT MASTER

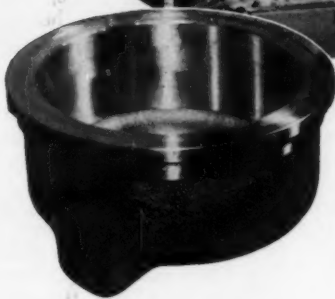
**is as easy as taking candy
from a baby"**



BULLARD

Thus, V.T.L. operator, Joseph Walent, at Crosby Steam Gage & Valve Co., summarizes his comments on their new 26" Bullard Cut Master, Model 75.

"With the movable Pendant Control I can work from the most advantageous position. You'd be surprised how much easier the Pendant Control makes it for me. It increases my production too, to have all the controls in one spot — no running back and forth from one control to another." This feature of the new line of Bullard Cut Master, Model 75 is only one of many reasons why you should have them in your plant.



Why not get the full story — ask for a catalog by calling your nearest Bullard Sales Office, Distributor or write

**THE BULLARD COMPANY
BRIDGEPORT 9, CONN.**



THE BASE of a Huntercraft Candelabra Model 8008 (shown below) requires, with Formbrite, only a finish buff. The base is formed in two drawing operations. The deeper drawn candle cups, also of Formbrite, need only a light cutting with Tripoli and a finish buff.

It's easy to get a jeweler's finish with Formbrite



HUNTERCRAFT Table or Wall Candelabra Model 8008, one of 30 fine brassware items in the line of Huntercraft Originals.

THE production of Huntercraft Originals—now a nationally distributed line of fine brassware—has grown from a basement hobby to a thriving new business in less than 5 years.

The Hunter Machine Service Company of Racine, Wisc., began manufacturing Huntercraft Originals on a commercial scale in 1951, using ordinary soft forming brass. To get the gleaming jeweler's finish required, pol-

"Formbrite cut polishing cost and time dramatically—was a major factor in keeping our small business alive . . . and growing," says Ralph E. Hunter of Huntercraft.

ishing time and costs were high. In fact, they were so high that the young company found it impossible to bring their prices into line with competition.

In 1953, they tried Formbrite®, Anaconda's superfine-grain drawing brass. The polishing bottleneck was broken and production soared—unit costs went way down. According to Ralph E. Hunter, owner and president of Hunter Machine Service Co., Formbrite was a major factor in keeping the company alive and enabling it to go on to become a stable, growing busi-

ness. The finish obtained so easily on Formbrite, he adds, is superior to that achieved on ordinary drawing brass.

Formbrite is a premium product at a nonpremium price. Find out for yourself how its superfine-grain, excellent drawing properties, strength, and scratch-resistance can help you make a better product at lower cost. Write for Publication B-39. Better yet, ask for a sample or a trial batch. Address: The American Brass Co., Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 6672

Formbrite SUPERFINE-GRAIN DRAWING BRASS
an **ANACONDA**® product
made by The American Brass Company

Automotive Production

(U. S. and Canada Combined)

WEEK ENDING	CARS	TRUCKS
NOV. 24, 1956	135,221	19,725
NOV. 17, 1956	143,923	23,487
NOV. 26, 1955	158,126	22,963
NOV. 19, 1955	185,359	28,109
TO DATE 1956	5,396,966	1,087,311
TO DATE 1955	7,508,628	1,202,022

*Estimated. Source: Ward's Reports

assembly plants, although Ford will not have a division similar to GM's B-O-P unit.

Ernest R. Breech, Ford board chairman, says that the Edsel will have a distinct appearance although one model in the line will use stampings that are interchangeable with the Ford and another model will use stampings that also can be used on the Mercury.

The Edsel Div. hopes to sell at least 200,000 cars in 1958. It believes that the Edsel can account for from 3.3 to 3.5 pct of the total car market.



"E" FOR EDESEL—A peek at the 1958 Edsel's hood ornament.

To accomplish this goal, the division wants to start out with at least 1200 dealers and hopes to increase the number to 2000. At this time, the division is considering dualing dealers who handle other Ford lines but will also have dealers who handle the Edsel alone.

All the tooling for the 1958 Edsel has already been released, although none of it has as yet been obtained. However, Mr. Krafve asserts that planning on the car is still on schedule. In

fact, planning for the next model in 1959 will be completed in December.

It is one of the few times in the history of the industry that planning for a second model will be completed even before the Edsel Div. brings out its first car.

S-P Status:

Studebaker-Packard nears break even point.

Curtiss-Wright Corp. still has no plans to merge with Studebaker-Packard Corp. Roy T. Hurley, board chairman at Curtiss-Wright, says it is more likely that S-P will merge or absorb other companies before it will join Curtiss-Wright.

S-P still has three main objectives. The first is to stop losing money. Secondly, it wants to make a profit and thirdly, it wants to diversify its product structure.

Mr. Hurley believes that it will not be long before S-P hits the break even point and he also says that the company should be in the black by the end of 1957.

It is not known just what S-P might have in mind in the way of diversification. But it will be at

AUTOMOTIVE NEWS

least another year before any definite steps are taken and they will be in a field that either has nothing to do with the auto industry or one where S-P will not have to compete with the Big Three.

Curtiss-Wright itself is shying away from a merger because, according to Mr. Hurley, the public reaction would be that the move was made just to harvest a tremendous tax write off.

Studebaker-Packard is going ahead with plans for a 1957 Packard. The new model will be shown at the New York auto show which starts Dec. 8. Plans call for it to be available to dealers sometime in January.

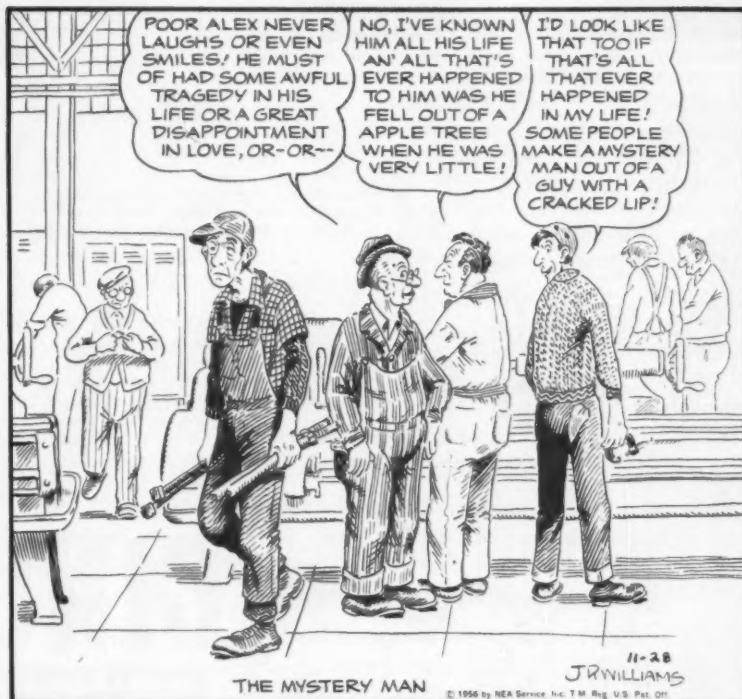
Millionth Flint Frame

Chevrolet's frame and stamping plant at Flint, Mich. turned out its millionth frame in less than two years.

The GM Div.'s plant has been operating since Dec., 1954. It passed the half-millionth mark last February.

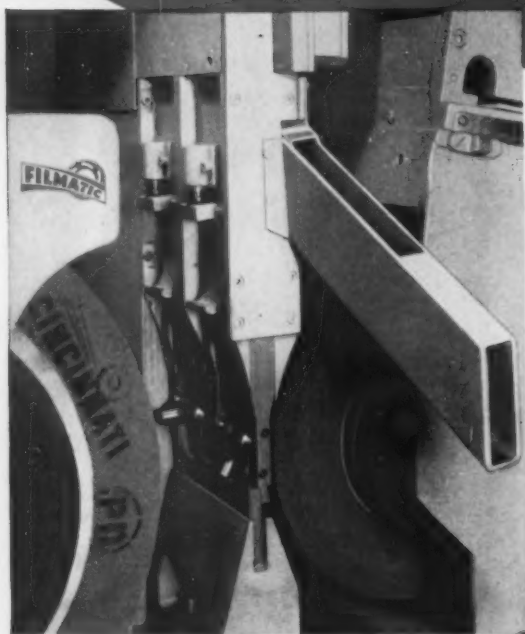
THE BULL OF THE WOODS

By J. R. Williams



Unique Transfer Idea Solved This Problem:

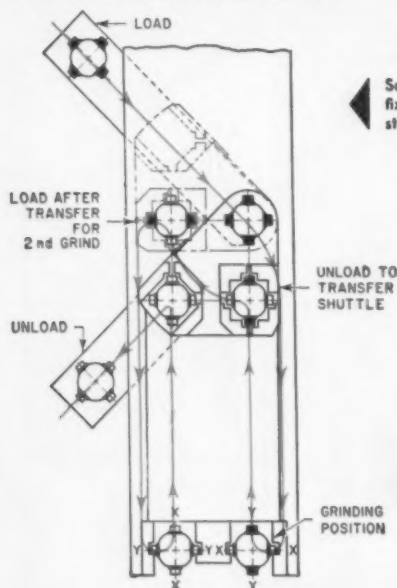
**Automatically Grind Four Diameters
of Universal Joint Spiders in One Cycle**



Two universal joint spiders are in process at the same time, grinding two pin diameters on each of two parts. Estimated production, 300 completed parts per hour.

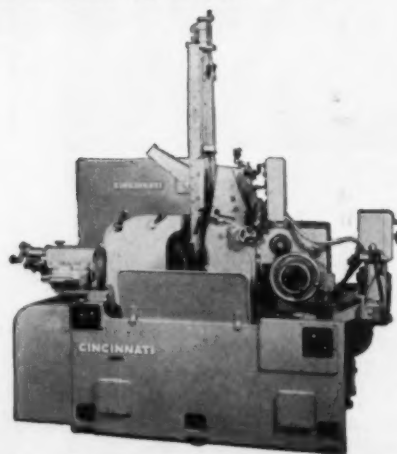
Everyone familiar with universal joint spiders will agree that it's a neat trick to automatically grind the two pin diameters on each of two parts at the same time. Cincinnati automation specialists devised a way to do the job on a new CINCINNATI® FILMATIC No. 2 Centerless Grinder. A unique transfer mechanism, incorporated in the loading fixture developed by Cincinnati for the machine, was the key to this low-cost method of production. Principle of operation is diagramed below at the left. ¶ The manufacture of universal joint spiders may not be your line of work, but some type of precision cylindrical grinding is required in your shop, and Cincinnati grinding and automation specialists can help you do a better job at lower cost. You can be sure that these men will give you the benefit of the most advanced thinking in centerless grinding methods, backed up by 33 years' experience. May we hear from you?

**CINCINNATI GRINDERS INCORPORATED
CINCINNATI 9, OHIO**



◀ Schematic drawing of loading and transfer fixture. Parts are ground on axis X in one station, and axis Y in the other.

CINCINNATI FILMATIC No. 2
Centerless Grinder, equipped to automatically grind universal joint spiders. You will find brief information on the standard No. 2 machine in Sweet's Machine Tool File. For complete data, write for catalog No. G-644-1.



CINCINNATI

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
CENTERLESS LAPPING MACHINES • MICRO-CENTRIC GRINDING MACHINES



You Can Forget About Defense Cuts

Mid East tension eliminates manpower cutbacks . . . Military budget due to go up \$1 billion . . . Missiles and rockets will get bulk of increase . . . Costs are also up—By G. H. Baker.

♦ **THE WORLD SECURITY** threat in the Middle East has cancelled the Eisenhower Administration's earlier hopes for cutting back military manpower next year.

Earlier, military chiefs had been conferring with Administration officials over the possibility of cutting back uniformed military personnel in 1957-1958 by 4 to 6 pct. This would have meant the release of between 112,000 and 168,000 men in uniform from the present total strength of about 2.8 million men.

But the present thinking in military circles is against any such cut. Fighting in Egypt and in Communist satellite countries has convinced the Administration that the world situation does not justify diminished U. S. defenses—either in weapons or in men—at this time.

\$ Billion More . . . The exact size of the sum to be asked of Congress for defense spending next year won't be disclosed until January. But advance reports from the Pentagon indicate that the figure will be somewhat in excess of \$37 billion—up by more than \$1 billion from the 1956-1957 rate. A portion of the increase is directly traceable to inflation and the resulting higher price tags on the products the Defense Dept. buys.

But the largest part of the increase is to pay for new and complicated weapons. Guided missiles and rockets again will be the two hottest categories in the long list of products bought annually by the Defense Dept.

If you're looking for a govern-

ment contract, get a toe-hold now in this expanding field.

Emergency Measures . . . The government's emergency headquarters sites (for use if Washington is bombed) are due for beefing up in the months ahead.

The "hideout" locations are already fairly well equipped as far as physical facilities are concerned. The next step will be to provide permanent staffs of government workers at the emergency relocation sites.

Last summer, the government's mock "defense-against-attack" exercises featured much confusion on the part of government workers. Many officials blame this confusion on the strange surroundings.

Are Unions Liable?

The U. S. Supreme Court will decide whether workers may sue a union for damages caused by loss of employment during a strike to which the workers object.

The United Automobile Work-

ers appealed the case to the high court after lower courts granted an electrician \$10,000 in damages. He complained that mass picketing and threats of violence prevented him from working during a 1951 strike at Decatur plant of the Wolverine Tube Division of the Calumet & Hecla Consolidated Copper Co.

The union claims the National Labor Relations Board has exclusive jurisdiction over such matters, but lower courts agreed that the Board had no power to grant a judgment and the worker was entitled to it.

In other recent actions, the high court:

Refused to review a lower court order requiring a firm to furnish payroll data to a union, although the court is now considering a conflicting lower court decision in another case which says such data does not have to be furnished.

Ruled against claims by federal government per diem workers for overtime pay for holidays worked at regular pay during World War II.

Lock The Lab Door Before Your Scientists Go

■ A congressional committee says the Defense Dept. should act quickly to bar pirating of government scientists and engineers by industry—a practice that's becoming more popular every day.

■ When the committee begins its hearings Dec. 10, you can expect its chairman, Rep. James C. Davis, D., Ga., to call for an end to the pirating. But how? The Civil Service Commission is thinking about boosting salaries for scientific and technical positions.

But this move will not necessarily be the answer. For industry simply might increase salaries still further and pass along the higher wage costs in their cost-plus government contracts.



Wysong No. 1010, capacity 10 gauge mild steel, cutting length 10 feet.

Greater Accuracy! Greater Production! Less Maintenance Costs!

Hi-tensile casting construction gives the necessary weight and mass to Wysong squaring shears. With a tensile strength of 35,000 to 40,000 P.S.I. hi-tensile casting construction can resist the shock and pounding a shear must take. The heavily ribbed table, knife-bar and end frames resist sag or deflection and *maintain accurate alignment*. Because hi-tensile castings absorb vibrations, Wysong shears run quieter and smoother.

Standard features of Wysong shears include:

- Automatic, compensating holddown. Each foot under individual tension. Compensates for varying thicknesses in metal and permits simultaneous shearing of different thicknesses.
- Ball bearing precision back gauge. Adjusts to .0078 (1/128th) inches.
- Time proven, trouble free, 9-jaw clutch with built in non-repeat unit.
- Straddle mounted gears, run in oil.
- Metal finger guard, mounted on holddown. Does not obstruct view of cutting line.

Wysong shears can be equipped with power operated back gauge, a light gauge, remote control switch, automatic lubrication, extension gauges, and rubber pads for holddown feet. Rake of top blade can be changed for cutting plastics, composition sheets and special metals.

Wysong also builds air power and foot operated squaring shears and bending rolls. See your dealer or write to factory for full information.

Buy a Wysong... It's miles ahead.



WYSONG

**Wysong and Miles Company
Greensboro, N. C.**



How To Cut Plant Labor Turnover

Annual opinion poll of its workers pays dividends for metalworking firm . . . By pinpointing sore spots it helps keep labor turnover well below the national average . . . Outside survey used—By R. R. Kay.

♦ **HAVING LABOR** turnover problems? Want some tips about hanging on to employees?

Here's a 10-year tested plan which cut labor turnover way down at one West Coast metalworking firm. It can be applied to your own plant, large or small.

Getting the Picture . . . The Garrett Corp., Los Angeles, polls its 10,000 employees every year. The Annual Opinion Survey, it finds, is an honest, down-to-earth picture of the company as seen by the workers. The survey is a valuable aid in pinpointing sore spots. A little attention to them, Garrett says, will go a long way toward making life happier for both the company and its employees.

Proof: Garrett now boasts only

a 1.3 pct manufacturing labor turnover vs the 3.5 pct national average.

Handling's Important . . . Typical questions: (1) How are the physical working conditions in your department? (2) Like the way your supervisor handles his job? (3) Like the company's personnel plans and policies: sick leaves, vacation, paid holidays, Christmas bonus, cafeterias, rest periods, etc.? (4) Satisfied with your merit reviews for salary adjustments?

Here's how the Opinion Survey is handled. Every employee gets a questionnaire at his home. He returns it, without his name, to an outside, impartial, consulting firm.

This protects the employee—keeps his ballot secret, and makes him feel free to speak his mind. Returns represent 70 pct of the questionnaires sent. All that management ever sees is a rundown on the results. And to keep the employees informed, the report appears in the plant paper. Psychological Services, Inc., Los Angeles, is management consultant on this 10-year project.

Typical replies: "I do not like the methods used by the personnel department to transfer employees." Garrett took the cue, put a man on the job full time, and whipped a sore point.

The survey draws out a wide variety of suggestions, many of which are put to use.

Modern Man and His Supersonic Aerial Mount

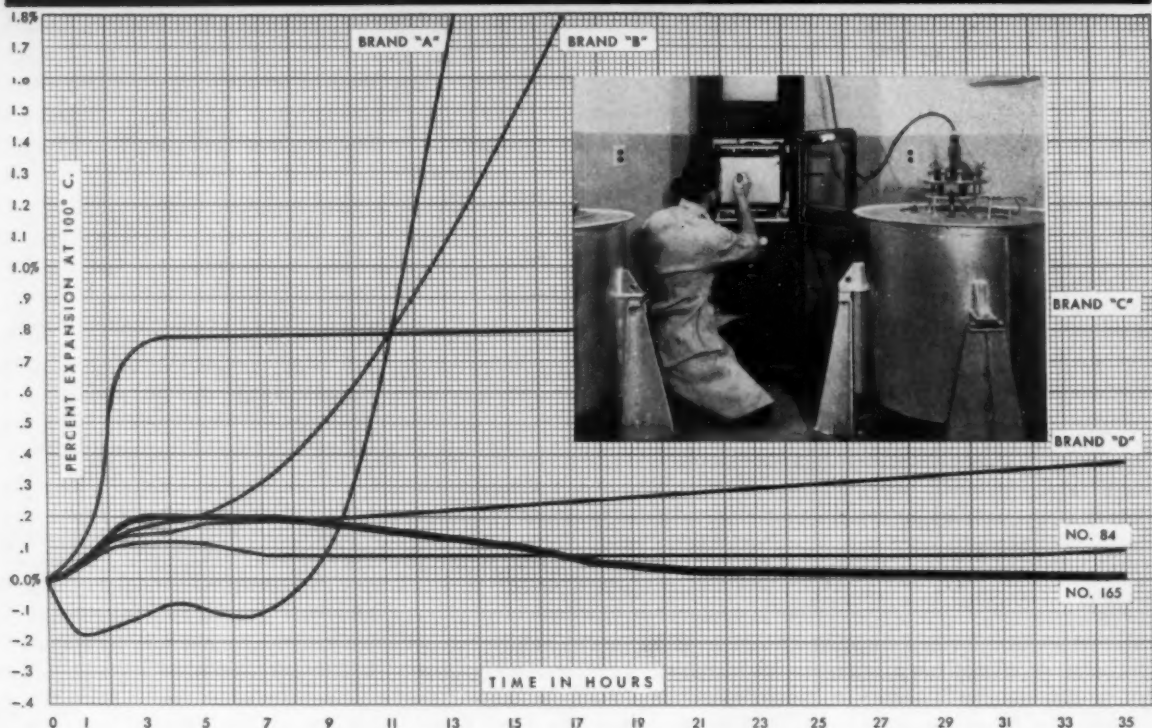


♦ **LIKE COWBOY** of yesterday, Test Pilot Tony LeVier gets ready to slip into his speedy steed, a Lockheed Starfighter. Although LeVier—first man to fly what's called the world's fastest fighter—appears to be standing far up front, he is actually 15 ft back from the plane's rapier-like tip.

The plane's small frontal area helps it attain still-secret speeds. Wings measure only 21 ft, 11 inches, tip to tip. Their downward slant gives good stability at all speeds, through and beyond the sonic region.

Wing edges are described as sharp as a knife. Extra fuel tanks are mounted on wing tips. This Starfighter, the XF-104, is nearly 55 ft long.

"SOAK AND SWELL" CHART shows why Permanente 165 Ramming Mix gives longest-life furnace bottoms



HYDRATION—reaction with water—during the heat-up period usually causes swelling of rammed magnesia bottoms. Leading ceramic engineers believe that as little as 0.3% expansion indicates damaging hydration, shorter bottom life.

To measure these minute expansions, Kaiser Chemicals Research developed the sensitive electronic instrument shown above. This device, called a dilatometer, can accurately measure and record expansions of less than 0.01% and maintain a constant temperature within $\pm 0.5^\circ\text{C}$.

Dilatometer Traces Charts

For the test charted above, equal size blocks freshly prepared from each of six well-known ramming mixes were placed in a common heating chamber and attached to the recorder.

The chamber was then heated to just below the boiling point of water with the atmosphere held at 100% relative humidity to create forced hydration conditions. Finally, the samples were allowed to soak for 35 hours to simulate hydration conditions which a mix may encounter in the deeper regions of a bottom.

As you can see in the chart, Permanente 165 shows virtually no signs of expansion... proof that

it resists hydration significantly better than any other ramming mix tested. (Permanente 84 Hot Patching Mix runs a very close second.)

Research Aids Bottom Performance

Permanente 165's outstanding resistance to hydration is an excellent example of how Kaiser Chemicals Research is working to give you furnace bottoms that last longer, need fewer repairs. Why not let your Kaiser Chemicals Sales Engineer provide research, design and installation assistance to help you take advantage of this superior ramming mix?

Call or write Kaiser Chemicals Division, Dept. R6121, Kaiser Aluminum & Chemical Sales, Inc., at any of the addresses listed below:

PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . 1924 Broadway

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Castables & Mortars
Magnesite • Periclase • Deadburned Dolomite



British Tout New Automation Aid

"Automation Base," made by British firm, helps out in forming and assembly . . . It can be adapted to drilling, reaming and other similar operations . . . U. S. tool shipments up—By E. J. Egan, Jr.

♦ A NEW AID for do-it-yourself automation of machining, forming and assembly operations is called an "automation base." The unit couples an indexing, work-holding device with up to 14 stations on which you can mount whatever work heads and tooling the job requires.

According to "Engineering," the British weekly, the machine can be adapted to do such machining operations as drilling, reaming, tapping, countersinking, milling, slotting and cutting-off. Or you can tool it up to bend, flatten, pierce, flange, rivet, mark, polish or count metal parts. With suitable gadgetry of your own design, it can also assemble the pieces it machines or forms.

How It Works . . . Basically, the machine consists of a waist-high, 32 x 36-in. cast iron table mounted on a cast iron pedestal. A 2-in. diam indexing shaft pokes up through the center of the table to accommodate work-holding fixtures. Indexing mechanism uses a cam, a pawl and a ratchet wheel, gives a choice of 6, 8, 12 or 24 index stops at will.

The machine table also has 14 work head or tooling stations spaced out around three sides; fourth side is usually left free for loading and unloading parts. Each work station is marked by a push rod which can be moved up or down 2 in. by means of its own cam under the table.

Multiple Choice . . . Idea is that the tool engineer can link these push rods to levers or other devices so that work heads and tools

will move in the desired direction. Contour of any push rod cam can be altered to give the proper combination of tool advance, feed and return.

Machine's three cam shafts and the work-indexing spindle are all driven by a single, 1-hp motor to insure proper synchronization. A self-contained pump and tank, also motor-driven, provides coolant for machining operations. For quick setups, the work table is hinged so that it can be removed easily with all tooling in place.

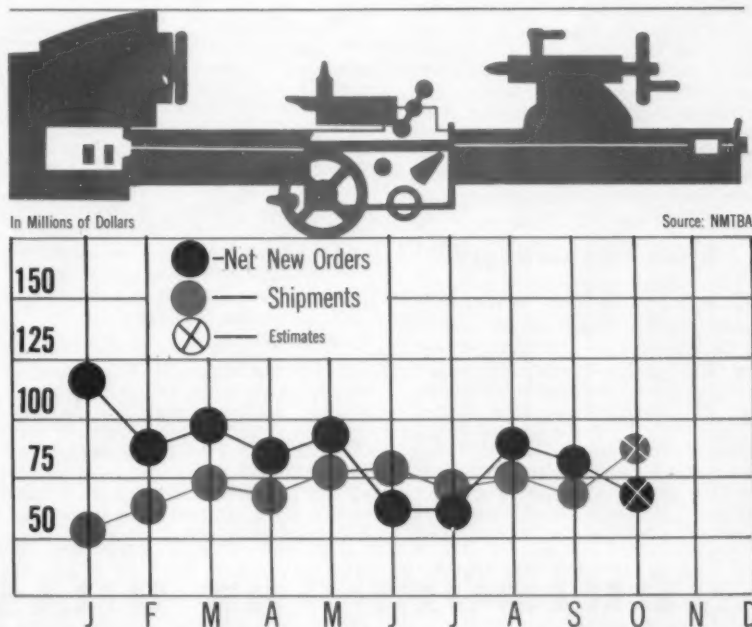
The "Compass Mark VII Automation Base" is a product of Bristol Repetition Ltd., Feeder-Road, Bristol 2, England.

Some High Spots . . . Rising costs of labor and materials have forced GE's Metallurgical Products Dept. to boost prices 5 pct on its standard and special Carboloy carbide blanks and standard tools. A 10 pct increase has been applied to the firm's mechanical tool holders, holder replacement parts and diamond wheel dressers.

U. S. builders of metal cutting machine tools put on some steam last month, shipped \$89.7 million's worth of equipment compared with September deliveries of \$71.1 million. But they didn't take in a comparable amount of new orders, netted only \$66 million in this area.

MACHINE TOOLS 1956

Metal cutting types only

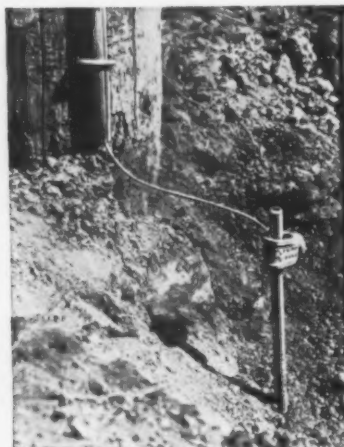


BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN



Reporting new developments in copper-base alloys and metalworking methods.



Bridgeport Silicon Bronze Gives Ground Rod Couplings Added Strength, Corrosion Resistance and High Conductivity

Lawrenceville Screw Company, Pittsburgh, Pa., makes a variety of products, among them couplings for Copperweld sectional ground rods. These couplings are produced in a variety of diameters and wall thicknesses to fit a wide range of rod diameters. The most popular sectional rod sizes are 8 and 10 feet. Each rod is made with rolled threads at both ends which screw into the couplings, permitting assembly of any number of rod lengths. By coupling together successive rods, the ground rod is made long enough to reach permanently good conducting soils. One such installation exceeds 200 feet in depth.

Machinability and Strength

Lawrenceville has found that Bridgeport Silicon Bronze No. 707 offers the exact combination of properties essential for both production and finished coupling. The uniform structure of this alloy permits efficient, close-tolerance machining. The manufacturer cuts class 2 threads for 2 1/2" on the internal length of the coupling, holding to .003" tolerance on the inside diameter. In addition, the high strength of Silicon Bronze No. 707 is ample to meet the stresses at rod joints and provide secure coupling. Ideal

rod conductivity is achieved by the copper-to-copper connection which Silicon Bronze No. 707 provides.

Composition

Silicon Bronze No. 707 is a standard Bridgeport alloy, approximately 91% copper, 7.5% aluminum and 2.5% silicon. It is a high-strength, corrosion-resistant alloy with a machinability rating of 60. Silicon Bronze is 9% lighter and about 50% stronger than annealed Naval Brass rod and has twice the endurance limit. Its tensile strength in the annealed condition is about 90,000 pounds per square inch and its corrosion and wear resistance are, in most instances, superior to brass.

Saves Weight

Forty to 50% lighter than Naval Brass, Silicon Bronze No. 707 offers substantial savings in weight and space without sacrificing resistance to corrosion and wear. Among some of the many items for which Bridgeport Silicon Bronze is well suited are valve parts, wire and cable connectors, nuts, thrust screws, gears, pinions, pump parts, rollers, worm gears and oil-burner nozzles.

Tips on Machining Silicon Bronze

The tensile strength of Silicon Bronze No. 707 in the annealed state is 90,000 psi with a Rockwell hardness of B85. Though its chips are brittle and break off similarly to leaded screw machine brass, the aluminum-silicon content of the alloy makes it tougher and requires a machine some 25 to 30% larger than would normally be used for leaded brass rods.

Use of Correct Coolant

Because friction between the tool and silicon bronze is considerable, the heat generated must be dissipated as quickly as possible. The coolant-lubricant must, therefore, be well directed and in plentiful supply. Generally, best results are achieved with a mineral oil.



Typical parts made from Bridgeport Silicon Bronze

Tool Hardness

Highest possible hardness is recommended for tools used to machine silicon bronze. For example: a form cutter with a C-65 Rockwell lasted four hours longer than the same tool with a C-62 hardness under the same conditions. For long runs, cast metal or carbide-tipped tools offer longer tool life and permit increased machining speeds.

Wide Selection

Silicon Bronze is only one of the many alloys developed by Bridgeport to meet specific, and often unique, requirements. Find out how Bridgeport alloys can help you in the design of a new product, or the more efficient production of a present item. Call your nearest Bridgeport Sales Office for experienced helpful service and prompt delivery. (0248)



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The Iron Age

SALUTES

Dr. Walter R. Meyer President of Enthone, Inc., he is an occupational rarity—a scientist and a successful businessman. In the field of metal plating and finishing he is a popular lecturer; holds many patents.

Every day Dr. Walter R. Meyer, president of Enthone, Inc., jumps the intellectual fence between the laboratory and the sales office with the agility of an Olympic hurdler.

During the past 15 years he developed a dozen patented processes for finishing metals. Yet in the same span he built a small business into a multi-million dollar organization with branch offices throughout the U. S., in Europe and South America. It wasn't easy.

Trained in the ways of science, Dr. Meyer made the transition to business tycoon via the trade publications field. He was born 50 years ago in Meriden, Conn.; developed into a brilliant student; won a chemistry scholarship to Yale University; was graduated with a Ph.D. in metallurgy.

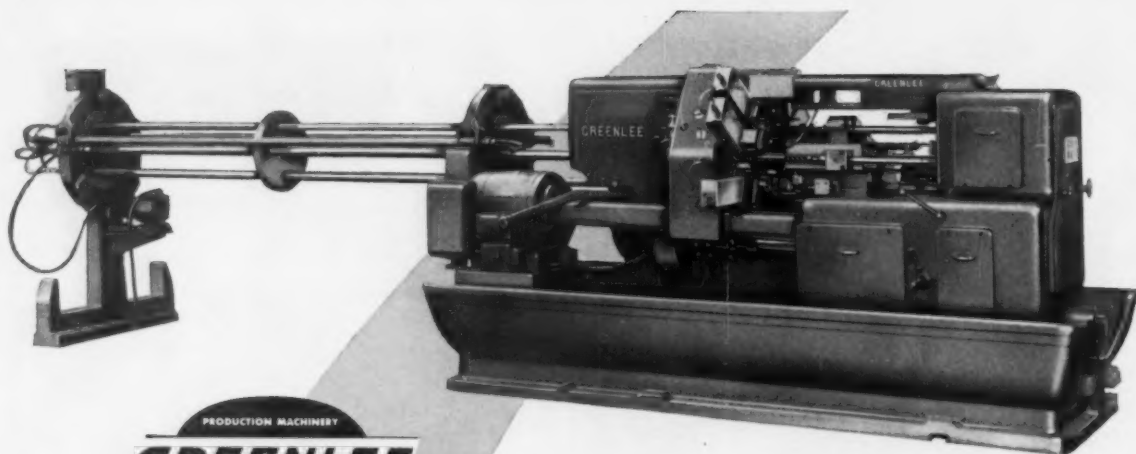
For nine years he worked as an industrial chemist and metallurgist with Sargent & Co., New Haven, and General Electric Co. From 1938 to 1942 he was editor of two leading metal

plating and finishing magazines. He streamlined these books; added greatly to their stature.

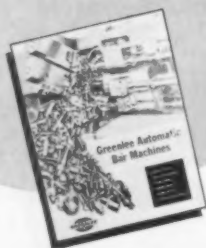
When Dr. Meyer joined Enthone in 1942, he had a lot of ideas about electroplating and he had the ability to carry them out. With his inventions proving very practical, he was able to build an international sales and distribution network.

Some of his patents cover electrodeposition of iron, stripping defective plate from finished pieces, and making aluminum surfaces corrosion resistant.

What Dr. Meyer knows he is willing to share. For years he has lectured to chapters of the Electrochemical Society, American Electroplaters Society, ASM, AIME, to service clubs and universities. His contributions to technical literature would fill a volume. For his work, he was awarded the Founders Gold Medal of the AES.



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- 6 **Eliminates Stock Pushers**
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The Iron Age INTRODUCES

Emerson R. Miller, named asst. to general superintendent; **William D. Millar**, named division superintendent, Coke and Coal Chemical Works and Blast furnaces, Central Operations, Fairless Works, U. S. Steel Corp., Morrisville, Pa.

John M. Walsh, Jr., named asst. general superintendent, Gary Steel Works, U. S. Steel Corp., Gary, Ind.; **E. Courtney Sorrells**, named asst. to general superintendent.

Alfred Luconi, named division superintendent, stainless steel, Gary Sheet and Tin Mill, U. S. Steel Corp., Gary, Ind.

Kenneth M. Wilhelms, named superintendent, Laclede Works, Laclede-Christy Co. Div., H. K. Porter Co., Inc., St. Louis, Mo.

J. Vincent Mahoney, named general superintendent, Niles branch, Truscon Steel Div., Republic Steel Corp.

Charles E. Bulloch, named director, product development, A. O. Smith Corp., Milwaukee.

F. John Pichard, named manager, standard equipment sales, Wheelabrator Corp., Mishawaka, Ind.

F. R. Putnam, named asst. to general manager, Blaw - Knox Equipment Div., Pittsburgh.

William T. Durkin, named manager, Pittsburgh office, Clark Bros. Co., Olean, N. Y.

C. J. Wilson, named director, manufacturing, The Bullard Co., Bridgeport, Conn.

Frank J. Hoder, Jr., named general manager, Pump Div., The Brown & Sharpe Mfg. Co., R. I.

William Verity, named asst. to administrative vice president, Armco Div., Armco Steel Corp., Middletown, O.; **George H. Todd**, named asst. to manager, Ashland Works, Ashland, Ky.; **Myron D. Bailey**, named superintendent, Foundry Dept., Ashland Works; **James L. Brady**, named superintendent, Blast Furnace Dept., Ashland Works; **J. Knox Dye**, named asst. to general superintendent, Blast Furnace, Foundry, Transportation and Labor Depts., Ashland Works.

Arthur C. Correll, named district sales manager, Waukegan district, American Steel & Wire Div.'s Cyclone Operation, U. S. Steel Corp.

W. D. Regnier, appointed division manager, sales, Machinery Div., Crown Cork & Seal Co., Inc.

Lothar S. Heym, appointed Youngstown district engineer, Mannesmann - Meer Engineering and Construction Co., Inc.



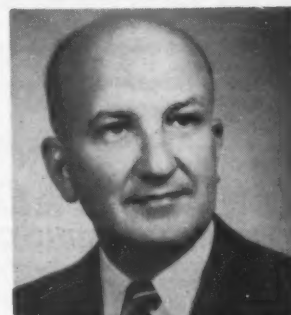
MERLE J. GRAHAM, elected vice president, production, Allegheny Ludlum Steel Corp., Pittsburgh.



DR. RUSH A. LINCOLN, elected vice president and technical director, Allegheny Ludlum Steel Corp., Pittsburgh.

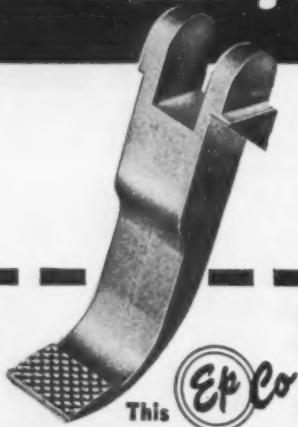


CARL B. POLLOCK, elected vice president, manufacturing planning and policy, Allegheny Ludlum Steel Corp., Pittsburgh.



HARRY L. JENTER, elected vice president, operations, American Steel & Wire Div., U. S. Steel Corp.

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INVESTMENT CASTING Proves the Point

PART: Paper Gripper for Printing Press

MATERIAL: Alloy Steel 4340

PROBLEM: To lower costs substantially below those of difficult and expensive forming methods yet retain the following features:

1. Sharp reverse knurling for more efficient gripper action.
2. Maintain uniform gripping action from part to part.
3. Eliminate milling and coining operations.

SOLUTION: An EPCO Investment Casting - - It produced a sharp gripping pad in true relationship to the center line of part.

CONCLUSION: When the shape of a part makes it difficult or expensive to perform special forming operations check an EPCO Investment Casting as a possible solution.

Send us drawings, samples and specification of parts for detailed process analysis and cost quotation without cost or obligation.

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Robert M. Tobin, appointed sales manager, powerworker section, Industrial Truck Div., Clark Equipment Co., Battle Creek, Mich.

John E. Lane, named district sales manager, Detroit, Fastex Div., Illinois Tool Works, Des Plaines, Ill.; **David Meyer**, named sales engineer, southern Ind. territory, Tool and Machine Div., Chicago.

Frank E. Kolb, named night superintendent, Chicago, **Joseph T. Ryerson & Son, Inc.**, Chicago; **John F. Nadon**, named superintendent, Detroit.

Jackson F. Long, named division manager, sales, Southwest Div., United Air Lines, Chicago.

James A. Wiggs, named sales representative, Phoenix, Ariz., Kaiser Steel Corp., Oakland, Calif.

George L. Flint, named sales engineer, Mallory-Sharon Titanium Corp., Niles, O.

Appointed divisional sales managers, Hannifin Corp., Des Plaines, Ill. are **Robert G. Brosberg**, air and hydraulic, Power Cylinder Div.; **William C. Thompson**, Air Valve Div.; **Arnold W. Blackshaw**, Machinery Div.; air and hydraulic presses and portable hydraulic power tools.

H. Phillip Blank, Jr., appointed asst. industrial engineer, Cleveland plant, Steel and Tubes Div., Republic Steel Corp.

R. J. Ronan, named regional manager, technical services, The Texas Co., Beacon, N. Y.

Charles H. Fuchsman, named director, development, Ferro Corp., Bedford, O.

Philip J. Clough, appointed director, Metallurgical Research Dept., National Research Corp., Cambridge, Mass.

George B. Croft, named western sales manager, Automatic Molding Machine Co., Los Angeles, Calif.



STANLEY B. WHITE, elected vice president, Kaiser Aluminum & Chemical Corp., Oakland, Calif.



R. F. MYERS, appointed sales manager, Machinery Manufacturing Div., The Motch & Merryweather Machinery Co., Cleveland.



HAROLD R. SUTER, appointed technical director, J. B. Ford Div., Wyandotte Chemicals Corp., Wyandotte, Mich.

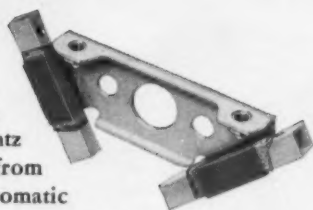


CHARLES J. HUNTER, named general superintendent, South Works, U. S. Steel Corp., Chicago.

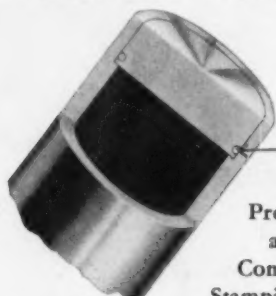
7 WAYS to SAVE MONEY with TOCCO* Induction Brazing

1

\$15.84 per hour was saved by Jack & Heintz when they switched from torch brazing to automatic induction brazing of these inverter brush mounts. TOCCO brazing also upped production from 40 to 360 brazed assemblies per hour.



2



Preplaced silver-solder ring

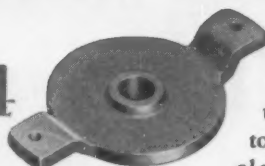
Production was doubled and cost cut 50% when Commercial Shearing and Stamping Company changed from welding to TOCCO induction brazing of these hydraulic cylinder assemblies. Heating time was cut from 15.3 minutes to 2 minutes on 5 1/4" cylinder shown here.

3



Willey's Carbide Tool Co. cut cost of brazing tips on large lathe tools from 58¢ to 4¢ when they adopted TOCCO induction brazing. Production is 8 times as fast with TOCCO—85 per hour, against 80 per day produced by a former method.

4



Formerly, Norris Thermador Corporation used arc welding to join this bushing and clamp. The change to TOCCO induction brazing reduced their costs 32%—from \$46.44 to \$31.73 per thousand parts.

5



When Mechanics Universal Joint Division of Borg-Warner shifted from welding to TOCCO induction brazing of this drive shaft assembly, they reduced the cost of the operation 67%. At the same time automatic TOCCO increased production from 11 to 45 pieces per hour—400% faster than the former method.

6



Packard engineers saved \$1.74 per part when this automatic transmission shaft was redesigned from a forging to a steel shaft and casting, permitting the use of TOCCO induction brazing. In addition to this per part saving, \$74,325 was saved in equipment and tooling.

7

Number 7—the lucky number—is up to you. Why not add your name to the list of companies who use TOCCO Induction Heating to increase production, improve products and lower costs. TOCCO engineers are ready to survey your plant for similarly money-saving results—without obligation, of course.

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Die Blocks with**



Machining time, such as planing, rough cutting, milling, hand benching and burring are appreciably reduced on Finkl SMQ Die Blocks. Thorough field testing shows that the Special Machining characteristic of SMQ saves shop time and gets the die into production sooner.

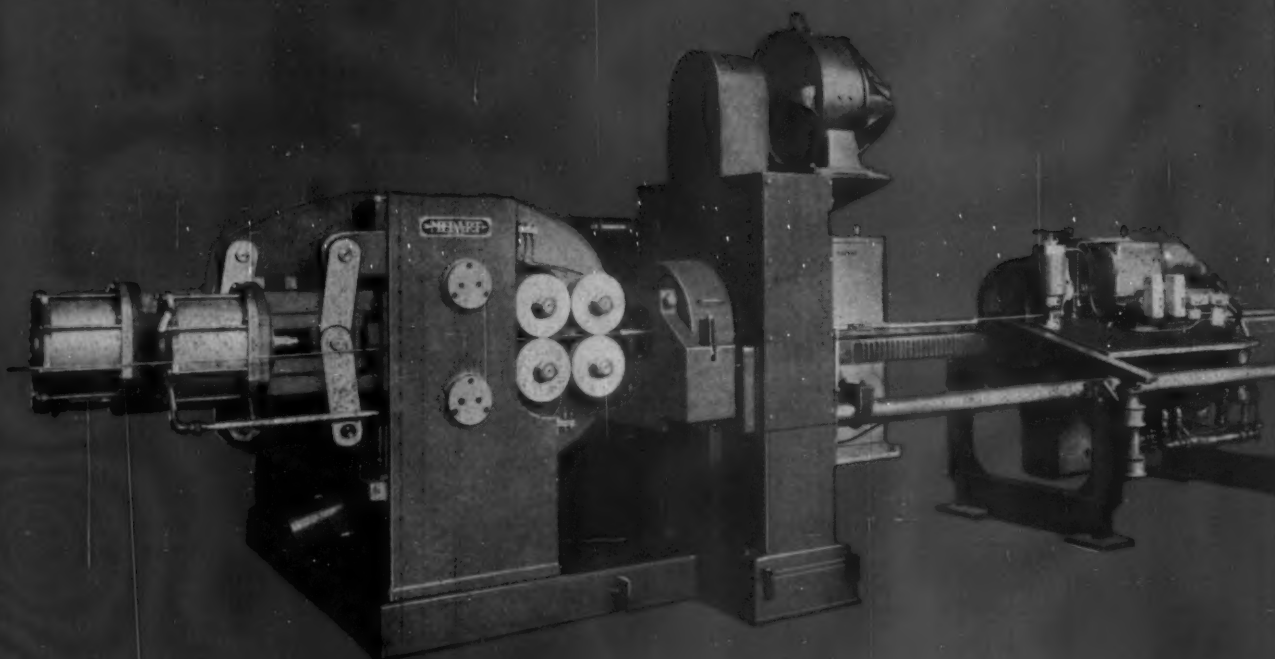
There is a Finkl steel available for any forging need. All are quality controlled through each step from our own melt shop to final inspection.

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BLAW-KNOX MEDART makes what it takes
for high speed, carbide, centerless bar turning

The new Blaw-Knox Medart RFPD Centerless Bar Turner is designed especially to take advantage of higher cutting speeds possible with carbide cutting tools. One pass through the machine accomplishes a complete removal of surface defects and decarburization at high production rates. And you get 100% recovery in the form of chips.

A patented "torque chipping" device absorbs the twisting imposed on the workpiece by the cutting tools. This feature opens an entirely new field of

turning small diameter bars. The workpiece is centered in the cutterhead regardless of variation in diameter by a pneumatically operated device on the roll feed. The workpiece is kept under positive tension by the pull-out carriage throughout the cutting action.

Blaw-Knox Medart fully automatic Centerless Bar Turners are available in sizes for turning $\frac{1}{8}$ " to 9" diameter bars. Call us for complete details, technical assistance or service.



BLAW-KNOX COMPANY

Foundry & Mill Machinery Division

Blaw-Knox Building • 300 Sixth Avenue
 Pittsburgh 22, Pennsylvania



PERSONNEL

George A. Most, Jr., appointed district manager, Boston, **Link-Belt Co.**, Chicago; **J. Charles Bullock**, named district manager, Moline; **Gene A. Zwerner**, named district manager, Albany; **C. C. Wiley**, appointed district manager, Washington, D. C.; **Paul Waldorf**, appointed district manager, Baltimore.

Louis W. Jander, appointed eastern regional sales manager, Yale Materials Handling Div., **The Yale & Towne Manufacturing Co.**, Philadelphia.

Leo B. Grant, named sales manager, Chemicals Dept., **The Dow Chemical Co.**, Midland, Mich.; **James Day**, named manager, New York office.

Appointments within the Sturtevant Div. of **Westinghouse Electric Corp.** are **Alexander Martin**, named sales manager, power apparatus; **Hiram W. Rainey, Jr.**, named field sales manager.

Neal J. Kemp, Jr., named mid-western regional sales manager, Yale Materials Handling Div., **The Yale & Towne Manufacturing Co.**, Philadelphia.

Roy M. Houck, named district manager, **Adamas Carbide Corp.**, Kenilworth, N. J.; **Robert H. Gessner**, named western New York sales representative, Buffalo, N. Y. office.

Appointments within **Aluminum Co. of America's** bauxite refining divisions operations: **Carr Smith**, named works manager, Mobile, Ala.; **James W. Wells**, named works manager, East St. Louis.

Franklin C. Williams, named sales coordinator, **The Falk Corp.**, Milwaukee.

C. A. Swanson, named asst. to chief engineer, installation-engineering, Engineering Dept., **The Youngstown Sheet and Tube Co.**, East Chicago, Ind.; **L. E. Malin**, named Chicago district engineer; **K. J. Scuderi**, named Chicago district electrical engineer; **W. B. Watkins**, named chief draftsman.

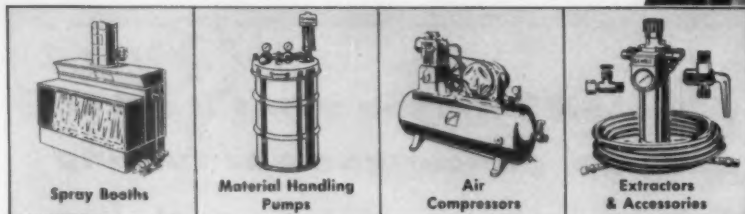
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there's stationary, portable or mobile equipment to fit your needs.

Name your production rate...
there's manual spraying, semi- or fully automatic equipment exactly keyed to your production requirements.

Over 60 years experience is built into Binks products...
experience in solving spray finishing problems in virtually every type of industry. This Binks bonus of professional dependability costs not one cent extra!



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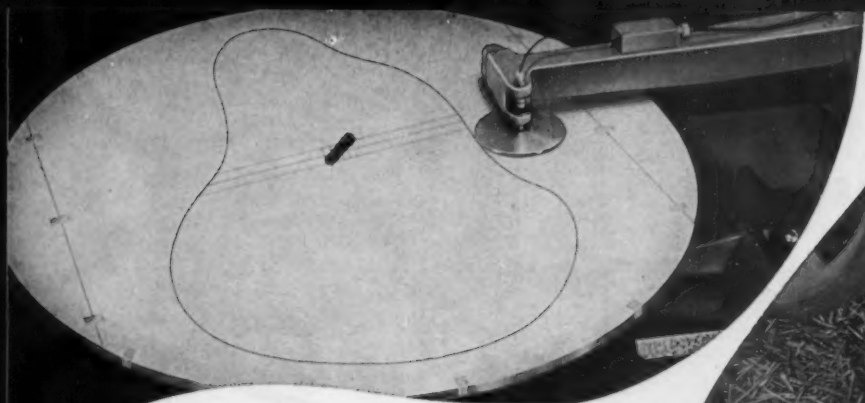
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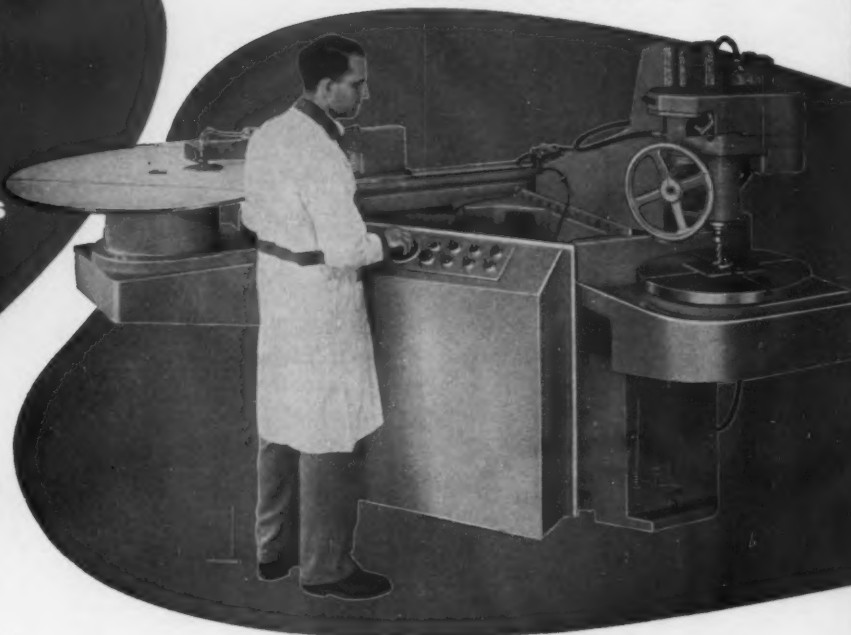
Here, the non-contacting tracer follows the large-scale contour drawing easily prepared with electrically conductive "ink." For this job, a 10:1 drawing-to-workpiece reduction ratio is used, but any desired scale such as 20:1 or higher can be selected.



Following the action of the tracer, the cutter reproduces the exact shape of the drawing on the workpiece. Due to the selected reduction ratio, any errors in the drawing are reduced in the same proportion; resulting in accurate milling or grinding.

mill or grind
**IRREGULAR
CONTOURS**
without
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- mill or grind directly from simple line drawings
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describing the Model 104 Cam and Template Machine. Or, write to West Hartford on your Company letterhead outlining your requirements. Manufactured by the New England Machine & Tool Company. Sales representation by Pratt & Whitney.



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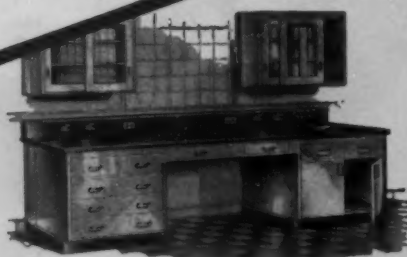
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Two Rivers, Wis.



Home laundry clothes dryer



Examining room equipment



Steel laboratory equipment

Accurate high production, at low cost, is maintained by a battery of Cincinnati Shears—in the manufacture of Hamilton automatic washers and dryers, hospital and laboratory equipment.

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Cincinnati Shears accurately cut various thicknesses of material, without a change in knife clearance—this is a profitable time saver.

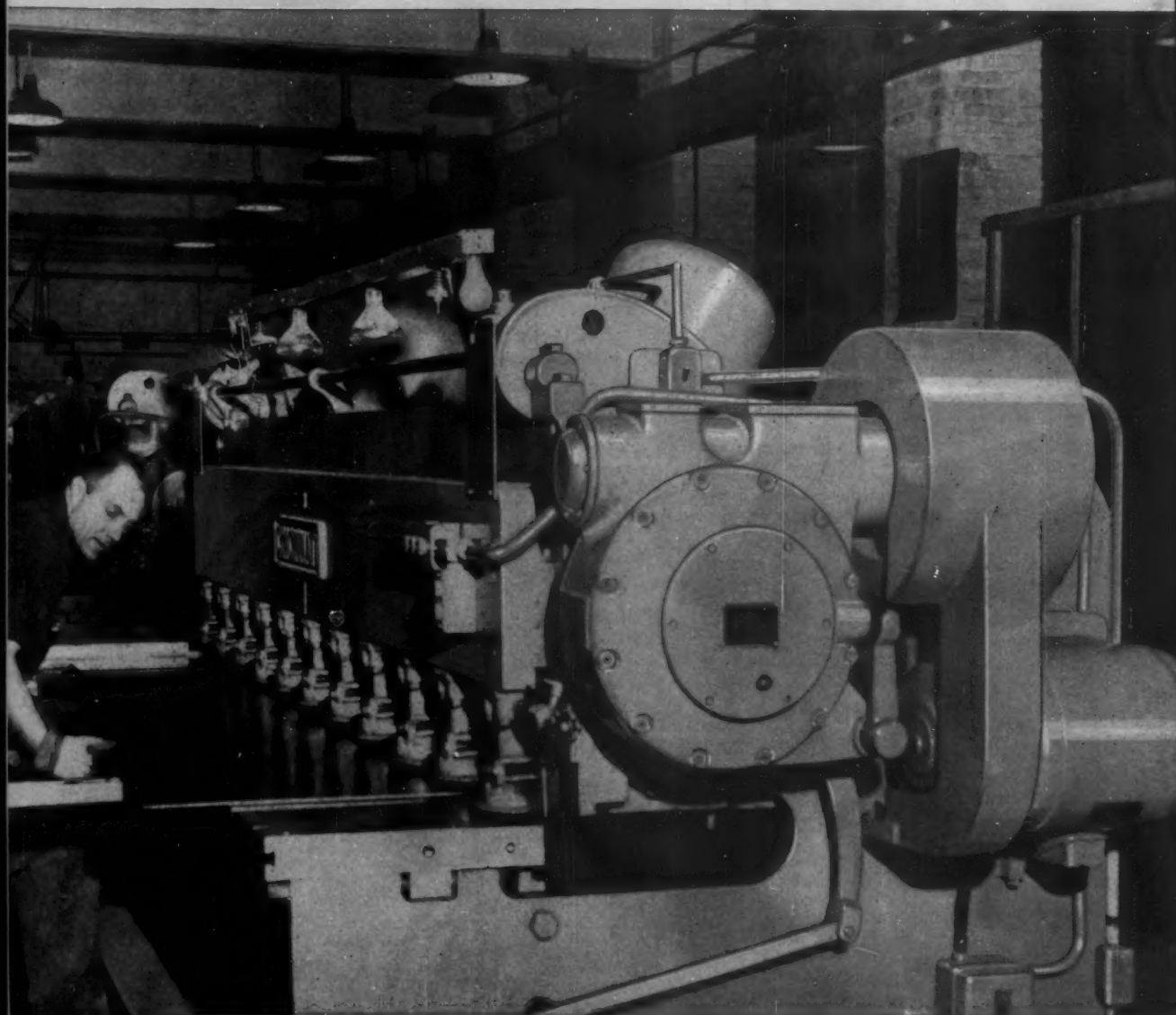
*Photos courtesy the Hamilton Mfg. Company,
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New front controlled power back gauges are now standard equipment on **ALL CINCINNATI SHEARS.**

Investigate these modern money making tools. Write for Catalog S-ZR.



**...25,000,000 lbs. of steel
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How BRAINARD STRAPPING SERVICE cut pipe handling costs 20%

FIVE TONS of cumbersome pipe, held by four bands of $\frac{3}{4}$ " .035 Brainard strap, are safely moved by overhead strap to a gondola car at the Sharon Tube Co., Sharon, Pa. . . with a 20% saving in manhours and materials! Entire gondola car is then secured with $1\frac{1}{4}$ " .035 Brainard strap. Loading time has been cut 60% from previous manual operations.

A Brainard expert worked out this successful, cost-cutting operation. No matter what you make, package or ship, a nearby Brainard representative can show you the way to similar savings. Call him today, or write . . .

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MAKERS OF QUALITY STEEL STRAPPING



What about 1975?—

IRON ORE

Steel Demand Calls For Higher Imports

By TOM CAMPBELL, Editor-In-Chief

- ◆ American, Canadian and South American policies will set—or change—usage patterns . . . Policy makers aware of world competition for our market.
- ◆ In 1975 U. S. will be consuming 169 million gross tons of iron ore . . . This estimate may be conservative
- ◆ By 1975 America will supply 59 percent of its ore needs . . . today it furnishes 77 percent . . . In 1975 Canada will supply 17½ percent, S. A. 19½ percent.

◆ AMERICAN AND CANADIAN IRON ORE BOATS are now being tied up for the winter. But the question of adequate iron ore supplies for our vast steel and economic expansion is still afloat. It has been partially answered. We know where the iron ore is. Statistics and solid estimates of output and sources are possible.

Steel and ore people may be a mite complacent about their future ore supplies. Perhaps they should be. They are free from the gnawing fear of 1947 that we would be caught short with a dying Mesabi on our hands and no adequate replacement.

Yet many things could shatter our nicely laid plans of ore supplies for the future. War has not been outlawed. Governments change hands. Nationalism is on the march. And costs in the United States and abroad are running—not crawling—uphill.

As things look now we have much more than a 50-50 chance of being properly supplied with ore at reasonable prices over the next 100 years. Before the next 20 years fly by the distribution could change drastically from what we now think it will be. The relative importance of future patterns depends on people and policies—not



Cleveland-Cliffs Iron Co.

the mere existence or availability of iron ore deposits.

Those outside our borders who shape ore policies—as well as America's ore and steel men—know that iron ore availability is tied up with a delicately balanced relationship between production costs, profits and national policies. Knowing this is one thing; keeping within bounds of the balance is another thing.

Some steel men worry privately

about their vast iron ore dependency. Perhaps this is unnecessary. Worrisome, too, is the knowledge that their foreign and domestic investments in ore must go up in the years to come; not down. Taconite development was not cheap. Its price has come high. But one compensation is that it constitutes a check on out-of-line foreign ore costs.

Price is the key

Interestingly enough—but not unusual—is the feeling of Canadian and South American ore policy makers. They want and need American ore consumption; but they have their own problems to work out, too. Yet they are cognizant that the price their ore must bring delivered to the steel plant determines how much if any of their ore will be displaced by someone else's—foreign or U. S. concentrates.

Each year communication between American steel and ore people and their suppliers in Canada and South America improves. And well it might in view of the inter-



ORE TRAIN nearing its destination of Seven Islands, Que. after 350-mile trip from upper Quebec. Twelve million tons were moved down this year.

national situation. Friendship and cooperation between American steel and ore firms and their friends in Canada and South America—and in Liberia, Dominican Republic and Sweden—is a proven asset; its continuance is urgently needed. It is not based only on good intentions, it is based also on actual accomplishments.

That is why there are at least five or six major—and new—ore developments underway in Canada. That is why, too, that Bethlehem and U. S. Steel plan even greater tonnages from Venezuela; and also why a new and large Venezuela iron ore and railroad project will get underway soon.

Barium Steel has plans to widen

Persons and Policies: Govern Ore Flow to U. S.

■ The mere presence of high grade iron ore does not necessarily insure its use in America's furnaces. Taxes, prices, political outlook and availability play their important parts. But those factors are usually determined by people.

The ore fields of Canada, South America, Liberia, Sweden—and the fabulous taconite plans in the U. S.—are the sources for our future steel expansion. The distribution of these ores depends in a large measure upon five men who now make, or at the least shape, iron ore policies for their country, province or state.



Quebec's Premier Duplessis

M. MAURICE DUPLESSIS, Quebec's Premier is fully aware of iron ore's part in his province's future. He believes in rewarding pioneering work. Free enterprise gets more than lip service from him. He sees Canadian mineral wealth as a complement to American capital. He is fully aware of world ore competition.

MR. JOSEPH SMALLWOOD, Premier of Canada's most recent province—Newfoundland—is another man whose policies are intimately tied up with development. His views are well known: his province is now backing a

substantial iron ore development. He is working hard to bring industries and developments to his country.



J. R. Smallwood of Newfoundland

The great states of Minnesota and Michigan have in their hands the fate and growth of the taconite and jasper developments. The expansion of these high cost—but strategic—projects to a 40-million ton yearly output rests with the policies of the governors and cabinets of these two states.

Governors **G. MENNEN WILLIAMS** of Michigan and **ORVILLE L. FREEMAN** of Minnesota recog-

Two-Decade Forecast of Iron Ore and Steel Demand

STEEL Millions of Net Tons			IRON ORE Millions of Gross Tons	
			Based on Steel and Iron Output	Based on Population Growth
Capacity	Production			
1956	128	115	128	131
1960	144	130	137	138
1965	162	146	150	150
1970	176	158	160	159
1975	186	167	169	167

Estimates of iron ore use in America based on steel and iron output are figured for 90 pct steel operations—rather than on estimated total capacity. For that reason the ore demand estimates may be too conservative.

By a distinct and separate approach the other set of estimates are compiled based on the 1710 lb. per capita ore consumption in 1953 and the new population figures of the Census Bureau (Series A—projections of growth assuming 1950-1953 level of fertility).

U.S. Iron Ore: Demand and Sources To 1975

DEMAND		SOURCES, Millions of Gross Tons			
		U. S.	Canada	South America	Other Imports
Total					
1956	128	98	13	13	4
1960	137	96	20	17	4
1965	150	94	25	26	6
1970	160	98	26	29	7
1975	169	100	29	33	7



M. A. Hanna Co.

its search for iron ore in the Dominican Republic where it has a high-grade lump ore development. Republic's relations with Liberia were never better and the trend there runs to a steady yearly shipment of 1 million tons. We will continue to bring in 1 to 2 million tons of Swedish ore. Contacts and activity in Peru, Chili and Brazil

are expanding at a good pace with satisfactory results to those firms involved.

The new Venezuelan iron ore and railroad project will start off in 1959 with 1 million tons to Europe. By 1960 it plans to ship 3.6 million tons of ore to the U. S.; 800,000 tons to Venezuela and 2 million tons to West Germany. By

1962 plans call for 6.2 million tons to the U. S., 800,000 tons for Venezuela and 2 million tons to Europe.

At first El Trueno—southwest of Cerro Bolivar—will be mined. Later this project envisages development of the government's San Isidro properties located in the general area of U. S. Steel's Cerro Bolivar and other concessions. Eventually it is expected that a railroad will be constructed from South Central Venezuela to tide-water in the North of Venezuela. Initially a 122 mile railroad will be built from El Trueno to Puerto Ordaz at the confluence of the Caroni and Orinoco rivers; loading point for U. S. Steel ore.

Big news from Canada

Bigger news comes from Canada. The U. S. Steel Corp. has about decided to mine—within the next 4 or 5 years—large deposits of low grade easily concentrated ore located about 140 miles north of Shelter Bay on the north shore of the St. Lawrence river. A railroad about 160 to 170 miles long will be built. This line will probably come directly down to the North Shore and wind along the shore towards Seven Islands where a loading dock and storage facilities will be built.

Iron Ore Co. of Canada is planning a significant exploration in the Wabush Lake area near Mt.

nize the threat of foreign ores replacing some taconites. For that reason these great states will shape their fiscal and tax policies to encourage a proper distribution of iron ore sources.



Mich. Gov. G. Mennen Williams

President PEREZ JIMENEZ of Venezuela by his oil policies has indicated that world competition controls the growth of mineral sources. He espoused the same policy for U. S. Steel's ore project.

The gist of this is that U. S. iron



Minnesota's Orville Freeman

ore use and sources will be balanced delicately between foreign ore and domestic concentrates in the years to come.



Pres. Col. Jimenez of Venezuela

"The long-term scrap shortage spells greater ore consumption . . ."

Wright in Quebec, west of its mile 224 on the Quebec North Shore and Labrador R. R. This ore runs close to 40 pct Fe, is easily mineable, is coarse grained and easily concentrated. It may be 1960 before representative tonnages are



UNLOADING ore from Cerro Bolivar at Canton RR's Baltimore docks.

moved out. This will require rapid expansion of railroad, dock and storage facilities at Seven Islands.

Cyrus Eaton will add more to the ore picture than his growing Steep Rock development. This Cleveland individualist will soon gather speed on his Ungava Bay project in northern Quebec. This calls for mining and concentration of ores at two locations on the East shore of Ungava Bay with transshipment to Greenland during the open season for storage. From there the ore will be shipped over a longer season to Europe: the open season in Ungava Bay is about 105 days a year.

More coming from Brazil

Fenimore Iron Mines Co. has also acquired concessions close to the Eaton projects. Ore from this most northerly area will probably go to Europe also. There is reason to believe that Mr. Eaton is much farther along in his project than is generally believed by people in the United States.

Another concentrated ore development in upper Quebec is being carried on by Jones & Laughlin Steel Corp. J & L has options on Quebec Cobalt claims in the Mt.

Wright area 185 miles north of Seven Islands, Quebec. The potential for this easily concentrated 35 pct Fe ore is substantial.

Canadian Javelin Ltd. is developing a large property in Labrador. Ore will be concentrated and then shipped to the U. S. and to Europe. Pickands Mather is this firm's U. S. sales representative. PM also has options of its own around Mt. Wright as well as options on Canadian Javelin concessions.

Concentrated ores from Quebec and Labrador may reach a total of 15 to 18 million tons by 1975—with much going to fill European steel demand.

Chile, Peru—and especially Brazil—will be upping their iron ore mining and shipments over the next 10 years. It is in those countries where we can look for the biggest surprises. But in the whole iron ore picture, persons and policy will determine the distribution of world ore reserves.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., THE IRON AGE, Chestnut & 56th Sts., Philadelphia 39, Pa.

THE IRON ORE PICTURE AT A GLANCE

Will there be a shortage of iron ore for U. S. Furnaces?

No! Sources are expanding in Canada, in South America, and in Michigan and Minnesota. These areas will supply the need for our gigantic steel expansion. As our direct shipping ores are depleted these new sources will supply a bigger part of our needs.

Is Europe short of iron ore?

Yes! The pattern is changing. Europe and Great Britain are buying large tonnages of ore from South America and Canada. They will take more and more ore from North America in the future.

Will this demand from Europe affect U. S. ore needs?

No, there is enough ore in this continent to supply all demands in the United States. The taconites are our ace in the hole.

How much ore will be needed by America by 1975?

Iron Age estimates conservatively that we will need 169 million gross tons of high grade ore. That will supply a steel production of 167 million net tons and greatly expanded iron casting needs.

Where will the ore come from?

This year 77 pct of our ore needs come from within our borders, 10 pct from Canada, 10 pct from South America and 3 pct from other foreign sources. In 1965 the picture will be: 62 pct from within the U. S., 17 pct

from Canada, 17 pct from South America and 4 pct from elsewhere. By 1975 the picture will be 59 pct from within the U. S., 17.5 pct from Canada, 19.5 from South America and 4 pct from other foreign fields.

What could boost these estimates?

A grater steel expansion than now foreseen would step up total ore requirements. Distribution would be about the same. The long term steel scrap shortage spells greater ore consumption. This will occur through: oxygen steelmaking, greater percentage of iron in open hearths and a sharp stepup in directly reduced ores.

Higher ore needs, in turn, would boost demand further for trucks, ships, machinery, oxygen and hydrogen plants and investments.

♦ AUTOMATION can now be applied to the production and inspection of small to medium-sized lots of metal parts on an economical, do-it-yourself basis. A variety of standard gaging, sorting and feedback control units is available in the Microtrol line of automation aids developed by Airborne Instruments Lab., Inc., Mineola, N. Y.

These carefully designed "building block" units can be used singly or in quickly connected combinations to bring a desired amount of automation to standard metalworking machines or manual inspection procedures.

Each building block performs one specific function, such as indicating workpiece size on an easy-to-read dial, or signalling a machine to correct itself when work dimensions are beyond permissible tolerances.

The complete line of equipment includes: (1) three types of gaging heads which contact the work in process and supply an electrical signal proportional to the dimension they measure. (2) five types of dimensional indicating units, and (3) a number of optional accessories that adapt gaging heads and indicating units to a wide variety of applications.

Make up own system

For a specific job, the user selects the combination of Microtrol units he needs. He can, if he wishes, add such mechanical aids to automation as work loading and handling devices, or locating fixtures. Airborne does not produce these items, instead finds that its customers often prefer to devise and build their own.

To simplify installation of the do-it-yourself units, each comes as a self-sufficient, separate package. Complete systems are built up by linking these individual components together, usually by plug-in type electrical connectors.

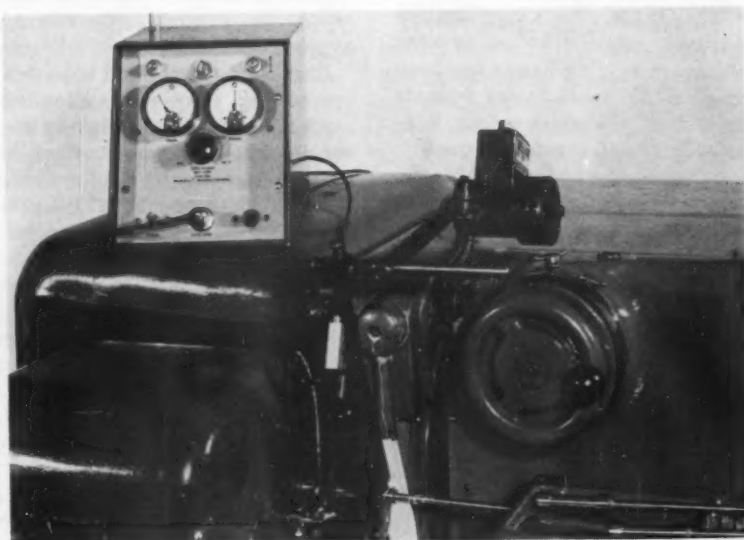
Although the Microtrol systems can work to microinch specifications, a typical installation will use as few as two electron tubes. Design and application of the components does not require the user to be an expert in automatic control theory.

A broach manufacturer uses one gaging head and one indicat-

Do-It-Yourself Automation Profits Short Runs



SORTING device (left) and inspection gage (right) are typical "building block" automation units.



GAGING head and size indicator improve speed and accuracy of plunge grinding operation.

ing unit to measure the thickness of flat stock ground on a plain surface grinder. This speeds production considerably, since work does not have to be removed from the machine for gaging after each pass approaching final size.

Other installations can go a step further, use the system to control machining to specified tolerances and then terminate the cycle. Equipment may also be used for inspection on a piece-by-piece or a statistical basis.

Take Six Steps To Better Brazing

♦ Silver brazing can produce strong, tight, low-cost joints of high quality . . . But for consistently good results, six elements of proper practice must be observed.

♦ Watching such factors as joint spacing, pre- and post-braze cleaning, fluxing and jiggling can improve quality immeasurably . . . At the same time, it'll keep costs down.

♦ TROUBLE with silver brazing generally means that one or more of the six brazing basics has been ignored. On these basics depends the ability to produce strong, leak-tight joints of consistent quality, say the Handy and Harman people. Observe them and you can realize low cost joining on your fabrication line.

The strongest joint results when clearance between parts falls between 0.0015 and 0.004 in. (Fig. 1). Measure this clearance at brazing temperature in joining dissimilar metals.

Tightness limits alloy flow

Too little clearance limits the amount of alloy that can flow into the joint. Scanty filler metal will produce a weak bond and sometimes cause voids.

Too much clearance may result in uneven distribution of the alloy, voids and wasted alloy. Reducing the capillary attraction between the joint faces and the molten alloy causes this.

All surfaces to be joined must be clean and free of dirt, oxides,

grease and oil. Flux can dissolve a thin film of oil, if present on mill-supplied materials, but it is not designed for heavy clean-up.

Oxides and dirt can be removed by emery cloth, steel wool, filing, or grinding. In large volume production, blast cleaning or pickling in batches may cost less than hand cleaning. Remove grease and oil with a suitable solvent, or in degreasing equipment.

Clean parts reasonably soon before brazing. Once cleaned, they should be handled carefully to avoid contamination.

Flux is essential in all but a few specialized operations. Joining copper parts with self-fluxing silver-phosphorus brazing alloys is such an exception.

Flux does three jobs: (1) it pro-

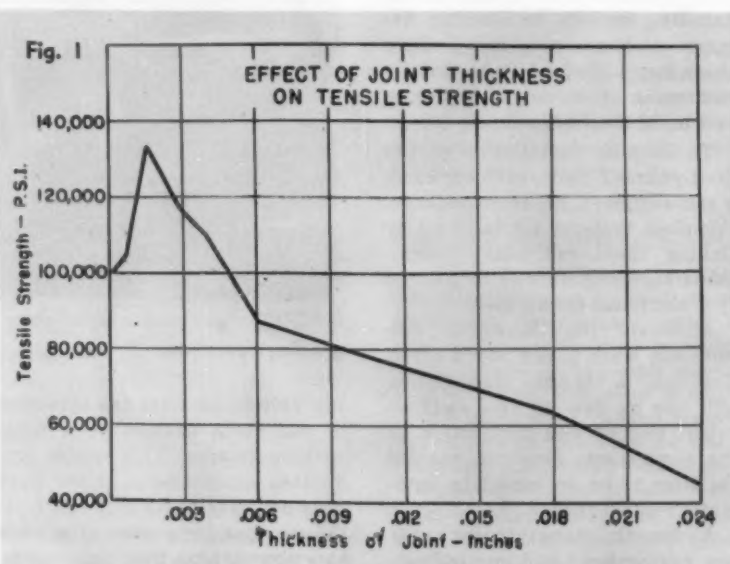
tects metal from oxidation during heating (2) it dissolves oxides that may form during heating, and (3) it helps flow the brazing alloy quickly and wet facing surfaces completely.

Apply enough flux to obscure underlying metal. Leave no gaps in the coating. The silver brazing alloy should be fluxed also.

Warming flux helps

If the flux refuses to wet some areas of the metal, this indicates an improperly cleaned surface. Flux will brush on more quickly, spread more uniformly and produce better fluxing action if warmed to about 90-100°F, and kept covered.

The flux should be applied just before the parts are brazed. This





DOUBLE-TIPPED torches help in brazing joints on tubing of small diameter. The dual flame heats both sides of the joint simultaneously.

so it will not dry and flake off to leave the metal without protection.

The assembly to be brazed should be jugged to prevent parts from shifting during heating. If clamps are used for support, make certain one end of the assembly can expand freely. Otherwise, it may distort or buckle in heating.

The fixture should touch the parts at only a few points. Contact points should be out of the heated zone to avoid conducting heat away from the joint area.

Keep fixturing as simple as possible. Assemblies containing tube and socket joints, and many others, are self-fixturing. These need lit-

tle support to stay aligned. Frequently, a simple hold-down rod pressing on the assembly will clamp parts in place.

It is desirable that a slight pressure push parts together, particularly when the brazing alloy is preplaced. This way, excess alloy and flux will squeeze out of the joint when they melt. The pressure will help seat the parts more firmly and produce a stronger joint.

To keep down oxide formation during heating, adjust the torch flame to a neutral or reducing flame. The flame tip should look somewhat bushy rather than sharp and needle-like.

Do not heat the joint directly. Instead, let the heat soak into the joint by applying the flame to the surrounding area. Keep the torch moving to heat the area uniformly. A stationary flame will exhaust the flux, cause excessive oxidation, and may distort thin gage parts.

If parts being brazed differ in thickness, the heavier section will need more heat to reach brazing temperature when the thinner member does. In brazing dissimilar metals, the more conductive metal should receive more heat. This makes up for the greater amount of heat it conducts away from the joint area.

Parts should be heated to brazing temperature as rapidly as possible, with due caution to avoid overheating. Exposure time to the

flame is thus held to a minimum, as is the possibility of oxidation.

If the silver brazing alloy is preplaced, do not attempt to melt it with the torch. Let heat soaked up from the joint area do the job. If the alloy is hand fed, do not feed the alloy until the joint reaches brazing temperature.

Flux appearance offers a good guide to joint temperature. As the flux heats, it gradually loses its white opaque color. At about 1100°F the flux appears to be colorless, transparent and somewhat glossy. Apply silver alloy a second or two later.

Temperature of the joint can be tested directly by melting the rod end of the brazing alloy with the torch, and dropping a small amount on the joint. If the alloy draws up into a ball or forms a sluggish puddle, the metal is not yet hot enough.

When the parts reach brazing temperature, merely lay a section of alloy in the joint seam. The alloy will melt and flow quickly into the joint like a thin liquid.

Alloy follows heat

If the brazing alloy does not distribute itself evenly through the joint, that area probably is not quite hot enough. Do not apply more alloy. Instead, move the torch flame with a brushing motion toward the empty section of the joint. The alloy will follow the heat and complete the joint (if enough is present), even though you may be working against gravity.

Flux can be removed most easily while the joint is still hot. Wiping the joint with a wet rag or quenching it from black heat will flake off most adhering flux. If the flux has become fairly cool, use hot agitated water. If the flux has cooled completely soaking and a stiff brush may be necessary.

Stubborn pockets of flux containing near insoluble oxides can be removed in a warm pickling bath of 10 pct sulfuric acid. Nitric acid should not be used because it may attack the brazing alloy. In practically all instances, flux can be removed by the normal pickling preceeding plating or other finishing operations.

Six Brazing Basics

- 1. Check joint for fit and clearance**
- 2. Clean faying surfaces properly**
- 3. Flux thoroughly**
- 4. Make sure jigs do their job well**
- 5. Pay attention to heating and alloy flow**
- 6. Clean completely after joining**

Compress Air To Power Many Plant Processes

By W. A. WHITESCARVER,
Process Engineer
Frigidaire Div., General Motors Corp.
Dayton, O.

♦ COMPRESSED AIR performs a variety of chores in modern manufacturing plants. For a source of fast, reliable and reasonably inexpensive stored energy it's hard to beat for many applications. Result is that industry has found half a hundred ingenious ways of harnessing compressed air for in-plant use.

Today, industry uses literally millions of cu ft of compressed air daily in processing, testing, assembly and other operations.

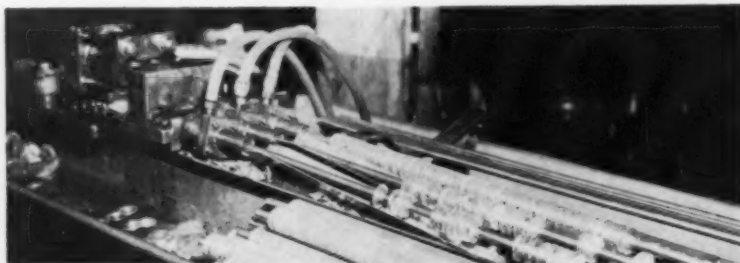
100 to 350 psi

General Motors Corp.'s Frigidaire Div. provides some interesting examples of such applications. In its Plant No. 1 (21 buildings; 1,300,000 sq ft of floor area, nearly 60 pct of it used for production), the company compresses more than 116-million cu ft of free air in an average month. This is for use in low pressure lines alone. These are 100-psi lines. Pressures at 250 psi and 350 psi are also supplied.

Major production items turned out by the plant are rotary, axial and hermetic compressors; refrigeration valves; cold control switches; relays, and various

♦ Gather in air, squeeze it sufficiently, and it's ideal for energizing half a hundred industrial operations . . . High-speed tools, air cylinders, riveters, air blowoffs, air chucking are typical . . . Plants constantly turn up others.

♦ One large plant utilizes 11 compressors to supply air at 100, 250 and 350 psi pressures . . . Besides several ingenious chucking arrangements, vibration operations find extensive use . . . Sensitive assembly, testing machines are about ready.



BUTTON FINs produced for use on evaporators, condensers, move along 15-ft long tubes by air-actuated vibration. Chucking fixtures are shown.

evaporator and receiving units.

In total, 11 air compressors of various sizes are used to supply the necessary air. Since 100 psi air is used in greatest volume, compressors push out 6000 cfm at this pressure. At 250 psi, 800 cfm is produced and at 350 psi, capacity is 600 cfm.

This air finds outlet in actuating dozens of devices. Air cyl-

inders, high-speed tools, riveters, air blowoffs, air chucking, air agitators and motors are some uses. Leak testing, pressure testing, paint atomization are other applications.

Air-powered chucking fixtures are used in various places throughout the plant. An example is a charging wheel using a group of air chucking fixtures for

processing of various refrigerant valves.

In operation, a capillary charging tube from the valve is inserted into the charging manifold used on the wheel. Air pressure in the manifold acts against "O" rings to provide a positive seal from the outside atmosphere. A series of vacuum and purge operations performed by the charging wheel clears the valve of all dangerous contaminants before the refrigerant charge is added to the valve.

Crimping guards charge

After the refrigerant has been added to the valve the capillary tube is crimped below the chucking manifold, thus insuring a positive charge for the valve for succeeding leak test and performance operations. This chucking principle has many other applications at Plant No. 1.

Another use of charging equipment is pictured above. This is an example of a charging station operating in conjunction with an overhead conveyor.

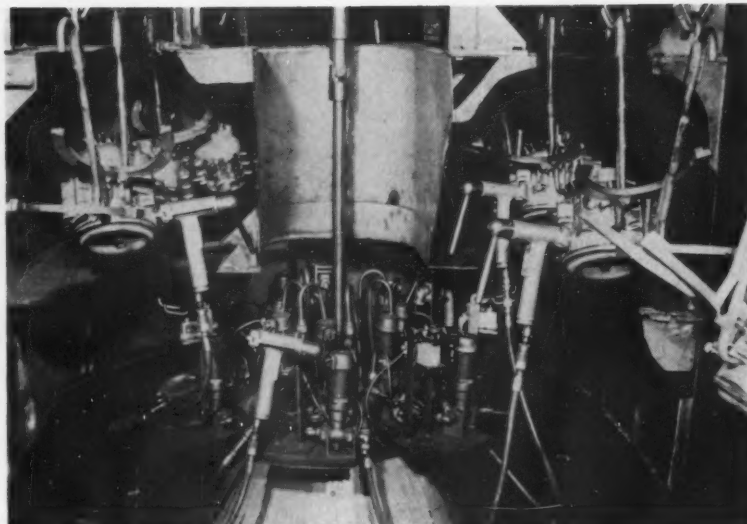
In this case, the station is charging the "Meter Miser" compressor used in the company's household refrigerators and in many commercial refrigeration units. Here, charging is done with 350 psi charge reduced to 250 psi just before the compressor, moving through the station, clears the safety hood. The unit then enters a leak test tank for visual check.

The charging gun used at this station and various combinations of fittings are used in final charging of the equipment as well as for numerous operations for leak-testing compressors, condensers, receivers and evaporators.

Vibration applications

Vibration using compressed air is also making its mark in industry today. Several kinds of evaporators and condensers built by Frigidaire, for instance, consist of a compact formed tubing with button fins. Compressed air plays a major role in putting these fins on the tubes.

Fins are produced on a high speed press operating at 900 strokes per minute. Each stroke produces three fins, one for each



COMPRESSORS are conveyorized through this semi-circular charging station before entering leak test tank. Entering charge is 350 psi.

line in the multiple fixture used. These fins are pushed to the tubing line lying in an angle iron trough. The opposite end of the 15-foot-long tube is chucked in a vibrating fixture, shown at left.

The copper tubing pushed into the chucking mechanism is then spring connected to a Cleveland Type C vibrator. This vibrator, acting as a hammer, is rubber-mounted. This is to insure that maximum effectiveness is transmitted to the tube.

Slowing rate helps

The vibrator has a rated capacity of 1525 vibrations per minute at 80 psi air pressure. Experimentation has shown that a reduction in strokes per minute reduces the time required to move the fins along the tube. This is achieved by reducing air pressure to 40 psi and spring-mounting the chucking fixture so the vibrator is effective on one stroke only.

This reduces the effective strokes to 380 per minute while still permitting the use of a large vibrator. This frequency moves the fins along the tube faster than they can be produced by the punch press.

This kind of setup has found extensive use on similar jobs in the company, not only at Plant No. 1 but at other plants as well.

New applications for compressed-air-actuated equipment are constantly being found. At present, a mechanized unit for assembling and testing of the lower bearing plate of the "Meter Miser" compressor is nearing completion. Some of the assembly work on this unit is accomplished through electrical limit switches, solenoids, vibrators and motors. But what can be used to replace the hand? What can perform the intricate finger-movements so necessary in the delicate assembly of small parts?

Air plays part in assembly

Compressed air again has proved the answer. On the lower bearing plate assembly, air cylinders are incorporated for many of these movements. Thirty-five such cylinders are used for positioning and inserting small parts, checking proper placement, polishing and testing seats and automatically marking rejected parts.

Other machines now under development include many air cylinders for specific operations in assembly and testing. As manufacturing methods improve in quality and efficiency, Frigidaire's demand for compressed air goes up proportionately.

For better bonding—

Control Flatness of High Strength PH Sheet

◆ Demand for precipitation hardening steels continues to rise . . . This boosts need for fabricators familiar enough with the material to avoid distortion when heat treating to maximum strength levels . . . Sheet is a particular problem.

◆ One way of controlling sheet distortion in heat treatment involves several stretch-flattening operations . . . Result is PH sheet steel to "bonding flatness" . . . A possible alternate calls only for a weighted rig of plywood and metal channel.

By L. E. LAUX,
Supervisor,
Manufacturing Engineering and Research,
The Glenn L. Martin Co.,
Baltimore, Md.



FINAL stretch-flattening occurs at near 1000°F, and is accompanied by up to 0.2 pct elongation. Percent elongation refers to the total sheet.

◆ **HEAT TREATING** high strength stainless steels can present difficulties. A key problem lies in maintaining a high degree of flatness in sheet stock. This applies particularly to the precipitation hardening grades, such as 17-7 PH.

Flatness assumes special importance when sheets are later joined, as by bonding. Successful bonding requires face-to-face contact at the faying surfaces.

The heat treating process described here achieves desired metallurgical results with a satisfac-

tory degree of flatness. A modified procedure coupled with several sheet stretching operations makes this possible. The technique came out of a development program on stainless steel sandwich structures used in supersonic aircraft.

Sheet thicknesses involved range from 0.010 to 0.050 in., inclusive. Full size sheets are normally heat treated: 42 x 120 in. and 36 x 96 in.

The stretching operations form a prominent feature of the new process. Laboratory tests show that sheet tensile properties do not

change significantly during stretching operations. This includes percent elongation, which refers here and later to stretching of the complete sheet—not a test specimen.

Strengthen to high levels

Tensile strength required of the heat treated 17-7 PH stainless steel sheet ranges from 180,000 to 210,000 psi. Minimum yield strength is 150,000. For sheet thicker than 0.036 in., minimum permitted elongation is 6 pct. No less than 5 pct total elongation is allowed in sheet 0.010 to 0.036 in.



TRANSFORMING calls for heating PH steel at 1400°F for 1½ hours, then refrigerating at -10°F. Stretching follows, then aging.

thick. Minimum permitted hardness is Rc 39.

In general, the Martin process follows that recommended by Armco for heat treating 17-7 PH. Its recommendations call for (1) heating the metal to 1400° ± 25°F, (2) cooling between -30°F and -40°F, and (3) aging at 1050° ± 10°F. The new process makes some slight changes in basic operations, and adds a number of refinements.

The sheet material arrives in the annealed or "A" condition. Gages up to 0.025 in. thick undergo gang rolling to remove dents or creases. Hand work eliminates indentations in the heavier gages.

Check flatness closely

Sheets then stretch to "bonding flatness" over a 1-in. thick plywood supporting plate on a Sheridan longitudinal stretch press. This involves total sheet elongation of 0.3 to 1.0 pct. Supporting plates measure 112 x 48 in. for one sheet size, and 84 x 48 in. for the other. A 48 x 10 x 1 in. shim underlies the plate at its lateral centerline.

Sheets are then checked on a vacuum table to a pull of 2 psi. The dial indicator reading cannot vary more than ± 0.005 in. over the sheet area.

After this preliminary flattening, the sheets undergo vapor degreasing first, then cleaning by the electro-alkaline process. After cleaning, sheets are wrapped in paper.

This protects them from fingerprints and deposit of carbonaceous matter while awaiting the next operation.

Fingerprints cause formation of a pitting-type scale during heat treatment at elevated temperatures. To avoid this, operators handle sheets with gloves at all stages of heat treatment.

Coil before heating

Initial heat treatment takes place in a cylindrical heat treating furnace. Coiling has been found advantageous for all gages during the 1400°F heat treatment. A cylindrical fixture holds the coils.

The rigidity of the coil plus the thermal protection of the fixture enable the sheets to escape warpage during this heat treatment step.

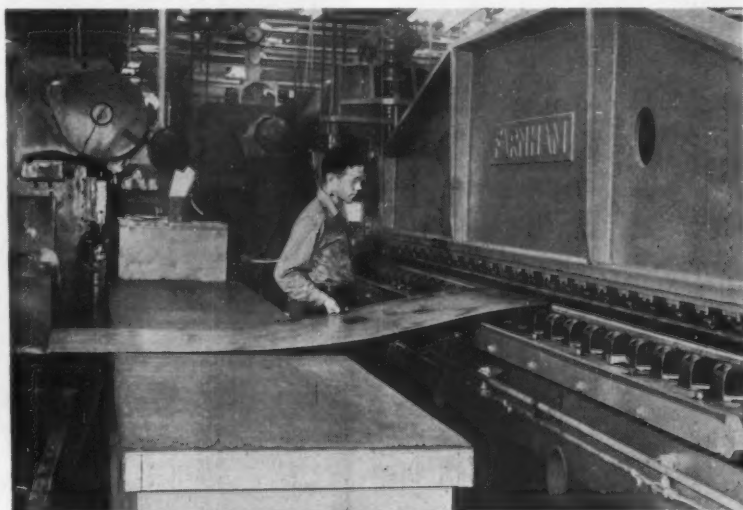
Sheets 0.032 in. and thicker coil to 30 or 31 in. diam on Niagara slip roll machines. Operators coil lighter gages by hand. After slip roll processing, heavy sheets are vapor degreased. All sizes are rewrapped in paper while awaiting hardening.

Held in fixtures

This transforming operation calls for an air circulating Leeds & Northrup furnace 33 in. diam and 55 in. deep. Coiled sheets are inserted in one of two cylindrical fixtures, both 30 in. diam, and either 36 or 42 in. long. Fixtures are 0.125-in. thick stainless steel with a carbon steel supporting structure.

The sheets are lowered into the transforming furnace, brought up to heat, and held there for 1½ hours at 1400° ± 25°F. After removal from the furnace, they cool to room temperature in still air while within the cylindrical fixture.

Operators then remove sheet coils from the fixture and truck them to a refrigerator at -10° to -20°F. Steel coils cool to ambient temperature and remain at -10°F or lower for 30 minutes. This departs slightly from the standard Armco procedure. There a refrigerating temperature of -30° to



SHEETS roll to "bonding flatness" here. Mechanical properties fall within limits normally. If not, sheet is again aged and stretched.

**"Sheet cools in the plywood-asbestos fixture as
flat as sheet stretched while cooling from aging temperature . . .
Properties fall in the same range . . ."**

—40° is normally specified.

On removal from the refrigerated area, sheets warm to room temperature while still coiled.

Sheets thicker than 0.025 in. are uncoiled by slip rolling. All sheets stretch a second time on the Sheridan press, elongating approximately 0.2 to 0.5 pct. Plywood 1-in. thick again serves as a supporting plate.

Chill, then stretch

Stretching after refrigeration is the most important single operation in the process. If acceptable flatness is attained here, it usually can be held through the aging step which follows.

Sheets 0.025 in. thick and less age in either an air-circulating cylindrical pit-type Lindberg furnace, or a air-circulating Lindberg rectangular furnace. The former holds workpieces 43 in. diam and 72 in. deep, and the latter parts up to 84 x 42 x 42 in. Thinner gage sheets sit upright in the furnace, coiled by means of encircling metal bands.

Heavier sheets in gages over 0.025 in. thick age only in the rectangular furnace. They slip into a rectangular steel frame fixture 80 in. long by 30 in. wide. This fixture supports the heavier sheets on their edges with a minimum of coiling or warping.

Sheets in appropriate furnaces are brought up to a specified temperature in the 1050° to 1080°F range, and held there within $\pm 10^\circ\text{F}$ for 1½ hours.

Flatten while hot

Final stretching takes place one sheet at a time. Individual sheets move directly from the elevated temperature of the aging furnace to the stretch press. Each sheet stretches on 1-in. plywood supporting plates to "bonding flatness" while at elevated temperatures. This involves elongation of approximately 0.02 to 0.2 pct.

After stretching, Farnham rolls flatten sheets less than 0.025 in. thick. Niagara slip rolls and Farn-

ham rolls straighten gages heavier than 0.025 in. If tensile properties test too high at this point, operators repeat aging and final stretching operations at slightly higher temperatures.

On cutting details for bonded structures, sheets sometimes develop a slight curl. This is corrected by rolling details in all gages on Farnham rolls.

An alternate method of cooling sheets from aging temperature has been developed. The fixture used for this consists of an asbestos-surfaced, plywood-metal framework table. Atop sits an upper plate of plywood surfaced with asbestos, weighed down with a lead-filled metal channel.

Watch for buckling

Detailed studies show that 0.010 to 0.050 in. thick sheet cools in the plywood-asbestos fixture to the same degree of flatness as sheet stretched while cooling from aging temperature. Only special provision for fixture cooling is that the sheet be absolutely free from buckles before aging.

Laboratory studies indicate that

in unstretched, heat treated 17-7 PH sheet, elongation varies randomly from 4 to 9 pct, depending somewhat on the gage. Tests indicate that stretching does not affect percent elongation, since measured values of the stretched sheet fall within this same range.

Control properties well

Tensile strength, 0.2 pct offset yield strength, yield-tensile ratio and percent elongation also fall within the same ranges whether the sheet stretches on a press or flattens in the plywood-asbestos fixture while cooling from aging temperature. There is also some evidence that test strips heat treated without stretching exhibit tensile properties identical to stretched and rolled sheet. Test specimens here were cut from the same rolled and stretched sheet later tested.

Successful use of the relatively simple plywood-asbestos fixture in final flattening gives some promise of lower costs in heat treating PH sheet. More experience will determine magnitude of these savings, if any.



ALTERNATE flattening method employs weighted plywood plate covered with asbestos. Metal channel framework is lead-filled.

New Tools Extend Uses For X-Ray

◆ NOW AVAILABLE to industry, two new radiographic tools hold promise of greatly broadening the usefulness of x-ray techniques in research and quality control. The one—an x-ray microscope—permits metallographic exploration of new areas. The other is a fast, filmless technique for producing x-ray images at low cost.

Both tools have been under development by General Electric's X-ray Department for several years. Apparatus for the "Xeroradiography" filmless image technique was developed in cooperation with the Haloid Co. and Battelle Memorial Institute.

Xeroradiography's sponsors believe its speed may make continuous, production-line inspection feasible for certain products.

The x-ray microscope offers several advantages over both optical and electron microscopes because of its ability to penetrate to the interior of specimens and reveal structures otherwise not visible. In magnifying power, it's not up to the electron microscope's capabilities (it's good for magnifications up to 1500 x). But neither does it require mounting the specimen in a vacuum or other special preparation techniques.

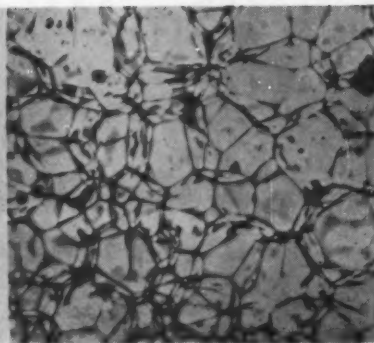
No sectioning needed

Against optical microscopes, depth of focus is its strong point. This permits three-dimensional examination, and no special sectioning of the specimen is needed.

These capabilities make it useful for checking on such vital factors as corrosion in metals and effects of foreign materials. It shows up minute foreign particles which ordinarily go undetected because they're beneath the surface, or appear identical with surrounding metal. Investigating soundness of electroplated coat-



ORDINARY LIGHT microscope shows up only surface scratches, a few tin lines on this aluminum-tin alloy (left). New x-ray microscope reveals complete grain outlines, with tin as dark areas.



ings and determining effects of various processes on the behavior and structure of metals are other applications.

The x-ray microscope can be used either for directly viewing an enlarged image of the specimen on a fluorescent screen or for recording the image on film.

GE thinks its xeroradiographic technique will find particular acceptance from industry in the field of light alloys, and in applications formerly requiring X rays at voltages up to 300,000 at short exposure time. Sensitivity of conventional x-ray film is approached and sometimes exceeded. Fineness of detail recorded on a film is generally well within the popular 2 pct sensitivity requirement for industrial x-ray films, especially on objects not requiring a great deal of X ray or use of high-voltage X rays.

Several advantages of the method translate themselves into time and cost savings, and promise extension of the x-ray inspection technique into new areas.

These are quickly spelled out. First, the process is entirely "dry"; no darkroom with chemicals is necessary to wet develop, then dry films. Secondly, plates



XERORADIOGRAPHIC image of this casting clearly reveals voids caused by shrinkage during cooling. These appear as white blotches.

can be "erased" and used over and over again. A third advantage, already touched on, is that images produced are extremely detailed. Finally, it takes only 20 to 45 seconds after the exposure is completed to have the plate ready.

The method produces an image having a bas-relief or three-dimensional appearance on an electrostatically-charged, selenium-coated metal plate.

Handle Chips Efficiently For Greater Shop Profits

Part 5

♦ Many types of ingenious equipment help to round out the complete chip-handling system . . . Besides the basics, these may include special conveyors, chip washers and driers, briquetting machines . . . Each has its economic justification.

♦ Automatic controls add the finishing touch to many fine continuous handling systems . . . Load controls, level controls, pressure controls protect equipment, insure smooth operation . . . Cleaning and briquetting scrap boosts its value.

By J. E. HYLER, Consultant, Peoria, Ill.

♦ **DEPENDING** on the needs of the particular plant, many ingenious items and arrangements of equipment help to round out a chip handling system for greater effectiveness. Certain types of conveyors, chip washing and drying facilities, briquetting machines are among these. On many fine continuous systems, automatic controls provide the last word.

Such instruments and controls handle a number of chores effectively. Systems involving pneumatic conveyors often employ simple manometers. These give a progressive indication of system air pressure or velocity.

Pressure controls are often incorporated to back these up. Going beyond indication, these automati-

cally stop the flow of chips to a pneumatic conveyor if an air-pressure buildup indicates lines are partially plugged or stopped. Other devices—level controls, load controls, basket unbalance controls—are applied to help insure trouble-free operation of chip crushers and oil extractors.

It's possible, for instance, to overload a crusher under some conditions. A crusher load control then helps to protect equipment.

The load control acts automatically to halt the flow of chips to the crusher when the motor of the machine is working at about 90 pct of its full rating. Feed resumes when motor load drops to about 75 pct of rating. The control operates only under sustained high load, not momentary surges.



Chain Belt Co.

OIL-FREE CHIPS, just out of the extractor, are dumped into bin feeding an apron conveyor. Conveyor relays chips on to bucket elevators.

A level control performs a useful function on the discharge end of the crusher. By governing the level to which chips can rise in the discharge hopper, it makes sure that the crusher has ample room to discharge chips. It acts on the conveyor feeding the crusher. When chip level is too high, it halts the conveyor until chips in the discharge hopper have fallen to the proper level.

Signal alerts operator

But sometimes crushers are not conveyor-fed, or it may not be desirable to operate the feed conveyor intermittently. An audible warning signal can then alert the operator that discharge-hopper chip level is too high.

Oil extractors may be somewhat

similarly instrumented. Under unusual conditions, an oil extractor in a continuous system might be ready to re-load before its feed hopper has a full basket load of chips available. Here, another level control on the feed hopper prevents recycling of the extractor until sufficient chips are available for a full basket load.

This level control also serves to stop the flow of chips to the hopper should the chip level be too high.

Similarly, there would not be room for discharging another basket load of chips from the extractor into the extractor discharge hopper if hopper chip level rose too high. Again, a level control is used to prevent extractor recycling until the level falls.

Stops off-center operation

Basket unbalance controls and zero speed switches are also used. The basket unbalance control stops the extractor motor and applies the brake if the basket runs out of normal balance at any time. The zero speed switch prevents recycling of the extractor until the basket has come to a full stop, to allow discharge of chips through the open bottom.

Pneumatic dry chip conveyors



Link Belt Co.

BRASS MILL SCRAP, chips and shavings are charged to induction melting furnace, left, by oscillating conveyor. Fork trucks load the conveyor.

are often used to carry chips from extractors to car loading or other disposal points, just as they are often used for carrying crushed chips over a considerable distance.

Metal chips are very destructive to sheet metal piping. So any pneumatic conveyors employed in such systems are made from steel or wrought iron tubing. Sheet metal systems may be economical in cases where chips are handled over very short distances, as from a machine to a truck or tote box located as close as possible.

A layout for such a sheet metal system includes a hood, located as close as possible to the cutting head. Air velocity and volume

must be sufficient to handle the chips. Amount of material, its specific gravity, and size of the face area of the hood determine proper air velocity.

Chip travel is then through the hood to a centrifugal cyclone, where chips separate from the air and are deposited into a truck or tote box. Air is discharged outside.

In some systems the extractor drops chips into a dry-chip holding bin and a screw conveyor takes them uniformly to an air-lock, connected with a pneumatic dry-chip conveyor. They then blow under high pressure through a steel tube to a holding bin.

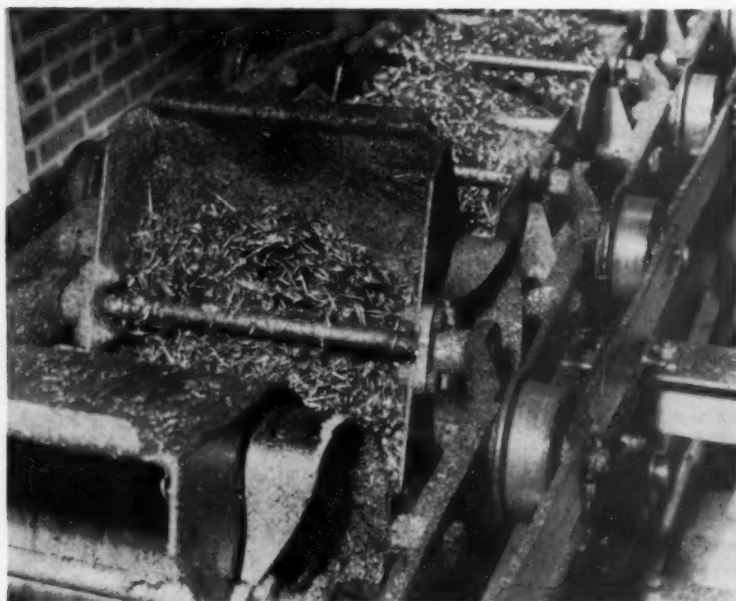
Sometimes this holding bin is located next to a railroad track, and has chutes to allow gravity-loading of freight cars. Such a bin holds well over a carload of chips.

Team up on overloads

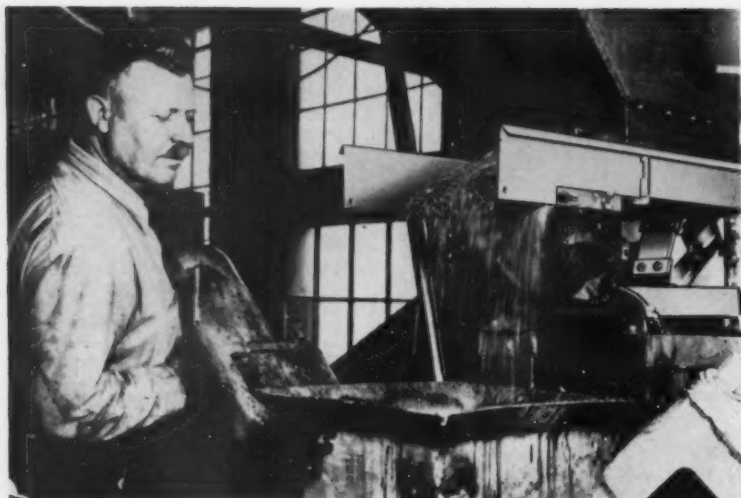
Plants sometimes machine both ordinary and alloy steels in high volume and more or less continually. An overall system may then incorporate dual chip handling arrangements to keep the different types of chips separate. Where a large volume of one such material may be temporarily running, the separate systems are arranged so they can be used together to ease the overload on the one system.

Cast iron chips can sometimes be marketed as chemical borings for a premium price, and there are other instances where particularly clean, dry borings or chips are worth more.

Chip washing machines and driers have therefore been adopt-



BUCKET ELEVATORS carry chips three stories upward in plant, discharge them into large storage bins feeding cars on railroad siding.



Syntron Co.

BRIQUETTING MACHINE (foreground) is fed lathe and milling machine chips and turnings by this magnet-operated vibratory feeder.

ed to some extent. Best results in removing tenacious soil which has dried on hot chips are obtained by combining a soak and spray washing method, using a conveying system which turns the chips to present all sides to the washing action.

Revolving-drum type driers are used to remove cleaning solution not automatically drained off chips as they pass upward through the chip-washing machine. The nominally horizontal drum of the drier tilts to control speed of chip passage through the drum. Controlling speed controls the degree of thoroughness with which chips are dried.

Direct flame's customary

Flights inside the drum lift and tumble chips. Usually an open blast of flame is used for drying, except where products of combustion might contaminate chips. Then a heat exchanger can be used.

Obviously, there's no set rule saying how chips must be handled from point to point. Apron conveyors, vibrating conveyors, bucket conveyors—all are used advantageously in different chip-handling systems.

The McQuay-Norris Mfg. Co. plant in St. Louis offers an excellent example of how oscillating or vibrating conveyors have been

applied to serve large batteries of machines. Here, 48 oscillating conveyors and two bucket conveyors discharge two types of chips, separately, from 381 screw machines. Link-Belt provided the system.

Chips leaving the machines go first to oil extractors, then directly to gondola cars. Oscillating conveyors are arranged in a dual system throughout, carrying high alloy tungsten steel chips and carbon steel chips simultaneously from any of the machines, but always keeping them separate.

Oscillating conveyors have also been used to advantage for feeding a mixture of nonferrous shavings, chips and other scrap to melting furnaces.

Such an installation is used at Revere Copper & Brass's Bedford, Mass., plant. A forklift truck loads an entire furnace batch of brass mill scrap, chips and shavings on the oscillating conveyor. As far as possible, lighter weight shavings and chips are loaded on the conveyor near its discharge end, to "cushion" furnace linings against heavier scrap.

Briquetting of chips may be worthwhile. Where briquetting equipment is used, it is usually put near the end of the chip-handling system so briquettes pass immediately into railway cars for shipment. Vibrating-type conveyors—some actuated by a magnet—are particularly useful, since they

deliver material at a metered rate.

Pulsating current energizing magnet-type conveyors act to pull the trough of the conveyor or feeder sharply down and back. Leaf springs then return it to its up and forward position, with a gentler motion than it had on the downpull.

Jiggles chips forward

Thus material in the trough falls perpendicularly, then carries forward with the trough. This action takes place repetitively at high speed. Rate of feed is rheostat-controlled to provide anything from a maximum amount to a trickling dribble.

One chief reason for briquetting is, of course, to reduce loss by vaporization when briquettes are melted. Properly-made briquettes act practically the same as solid blocks of metal when melting, there being almost no loss by vaporization.

Where there is a large volume of turnings and borings, briquetting plants retire their cost quickly. This is particularly true when a briquetting press is made part of a complete chip-handling system.

Bring better price

Good briquettes are approximately 80 pct solid, and fuse together during the melting stage. Since they're made completely of machinable metal, they readily classify as high grade scrap.

Some hydraulic briquetting presses are automatically controlled by either hydraulic or electric means.

Different methods can be employed for handling briquettes from the press to the cars. Selection of the best method depends in part on circumstances at the individual plant. One method found excellent allows briquettes to roll into a pit on leaving the machine. An electromagnet, mounted on a monorail running over the pit, permits easy removal of such processed scrap.

Some flexible layouts permit magnet discharge of briquettes to either a loading point for trucks or to storage bins.

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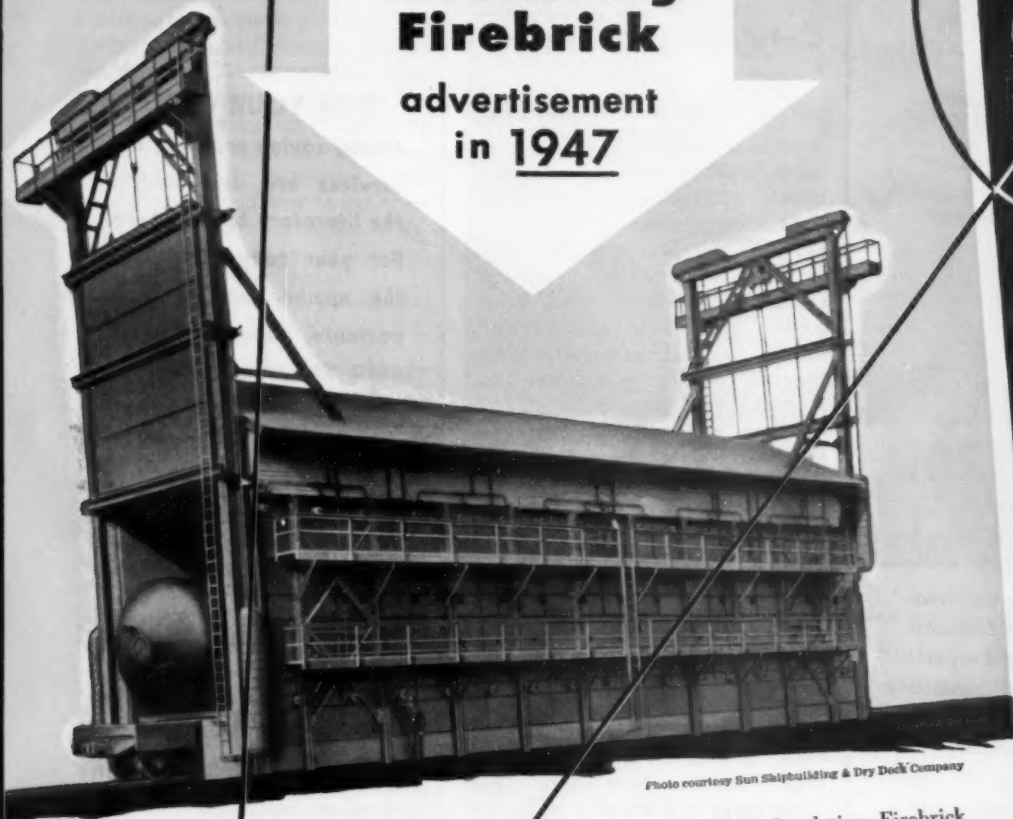


Photo courtesy Sun Shipbuilding & Dry Dock Company

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New Technical Literature:

Catalogs and Bulletins

Mechanical handling

Mechanical materials and equipment handling systems are thoroughly covered in a new folder. Consisting of about 100 pages, it is tab indexed. Offered is descriptive matter on numerous types. Application and design are covered. Multicolored illustrations, action photographs and abstract artwork make for easy reading in a folder that is literally "filled to the brim" with handling information. For free copy, write on company letterhead to: *Mechanical Handling Systems, Inc., c/o THE IRON AGE, P. O. Box 77, Village Station, New York 14.*

Sheet flanger

Sales literature now available offers information on a sheet metal flanging and forming machine. With appropriate tools, the unit works metal up to 0.104-in. thick. It can handle wired or false wired edges on external and internal curved or straight edges, and plain, return bends, off-set, flared, large radii and half-round flanges also on curved or straight edges. *F. J. Edwards, Ltd.*

For free copy circle No. 1 on postcard, p. 97

Seamless tube

Small seamless tubing and tubular components are the subjects of reading matter just published. The seamless tubing includes sizes from 0.005 to 0.625-in. OD, with walls from 0.0010 to 0.065-in. It details specialties such as fine aluminum alloy tubing and metal-shielded wire. Space is devoted to production facilities for drawing aluminum, copper and nickel alloys, stainless and low carbon steel, nickel and phosphor bronze. Second operation work is also covered. *Uniform Tubes, Inc.*

For free copy circle No. 2 on postcard, p. 97

FOR YOUR COPY

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, page 97.

Screw machines

Typical screw machine work on tough alloys gets illustrated in a brochure now available. It depicts work on stainless steel, Inconel, nickel and titanium. Dimensions, tolerances and fabrication operations are covered. It includes data on both cold-headed and screw machine products. *Allmetal Screw Products Co., Inc.*

For free copy circle No. 3 on postcard, p. 97

Solvent

Salvage of defective encapsulated circuits and parts is possible where plain or cure epoxy or polyester resins are involved. A technical bulletin describes a simple soaking application that allows this. There is no labor involved. Moreover, the material is not exhausted, but can be used over and over again. *Mona Industries, Inc.*

For free copy circle No. 4 on postcard, p. 97

Time delay relays

Details on three basic time delay relays appear in a catalog supplement now available. Included are part numbers for standard ranges and voltages in ac, dc and 400-cycle. Timers are available in extruded aluminum dust covers, it says. The bulletin includes photos of the models, wiring, diagrams, operation principles and dimensions. *The A. W. Haydon Co.*

For free copy circle No. 5 on postcard, p. 97

Humanics

"Humanics," is a pocket-sized booklet dealing with the human or personal issues and problems in labor-management relations. Such topics as: team work, planning, employee effort and creative ability are debated. Employee ideas, their treatment, modes of acceptance and rewards make up an interesting section of the treatise. What you should tell your employees about your business and how to get their point of view are discussed in detail. The booklet is one of a series. *Wheeler Associates, Inc.*

For free copy circle No. 6 on postcard, p. 97

Power plants

A zero-power reactor is explored in a new company publication. In addition, the 28-page journal contains information on a giant electric power station and an incinerator plant. A descriptive article also covers thermal rating of heat exchangers by electronic computer. *ALCO Products, Inc.*

For free copy circle No. 7 on postcard, p. 97

Swivel joints

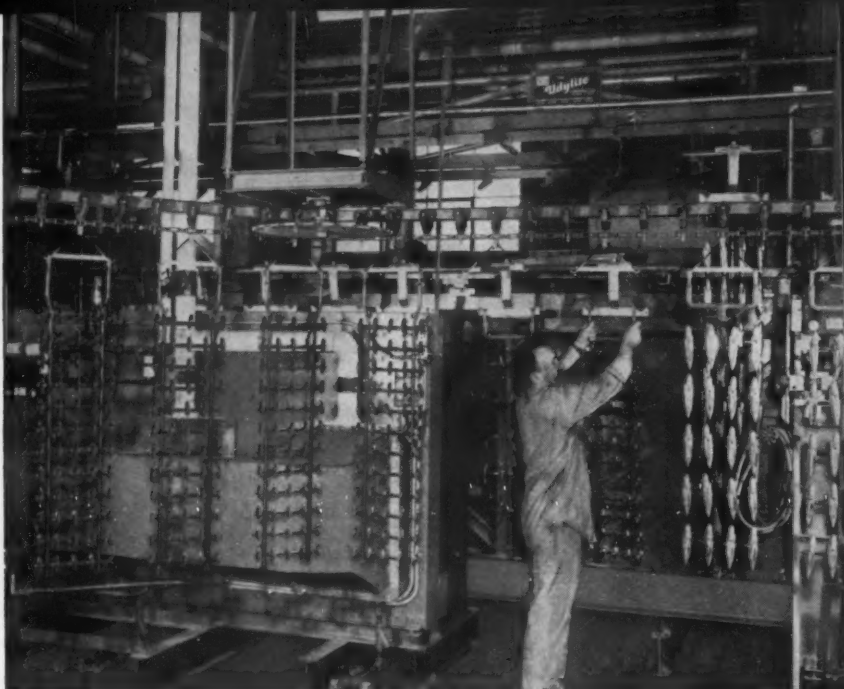
Aircraft type swivel joints on piping and tubing are covered in a dozen-page catalog. It explains a low torque plane swivel type unit which provides 360° rotation in a single fixed plane. Also explained is a self-aligning type which provides 360° rotation plus 15° side flexibility. Illustrations of all standard patterns are shown. *Barco Mfg. Co.*

For free copy circle No. 8 on postcard, p. 97

Tube fittings

Tube fittings appear in a presently available brochure. Descriptions, photographs outside diameter and pipe threads are listed for several models. These fittings offer no metal to metal seal. The seal and grip are separate. Their use eliminates flaring, threading, welding and soldering. It includes specifications for flared and flareless end connections in aluminum, steel and stainless steel for pressures up to 4000 psi. *Lenz Co.*

For free copy circle No. 9 on postcard, p. 97



QUALITY IMPROVED — PRODUCTION INCREASED WITH UDYLITE PROCESSES AND EQUIPMENT

In the manufacture of rear view automobile mirrors by Yankee Metal Products Corporation of Norwalk, Connecticut, a variety of die cast parts are used. All of these die cast parts are copper, nickel and chrome plated on the Udylite Full Automatic Plating Machine. Shape and sizes of these parts vary considerably.

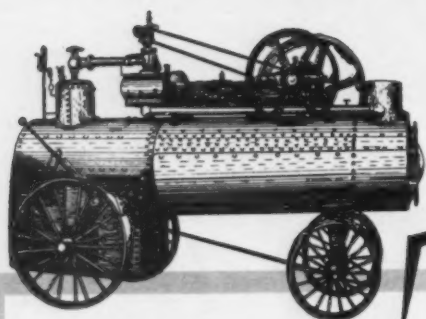
The Udylite Full Automatic handles the complete processing of the parts from the bare die castings to a finish ready for final assembly. Its operation has provided perfect precision, a doubled capacity and a minimum of rejects.

Udylite Bright Nickel has played an important part in the perfect coverage of these die castings. With the chrome overlay, Udylite Bright Nickel has provided not only the glistening finish demanded for this luxurious line, but also the guaranteed protection for these accessories which are constantly subjected to attack by the elements.

Hand in hand, Udylite equipment and processes are solving many plating problems. Providing sales appeal finishes—plated protection—multiplied production. Find out how you can use these same advantages.



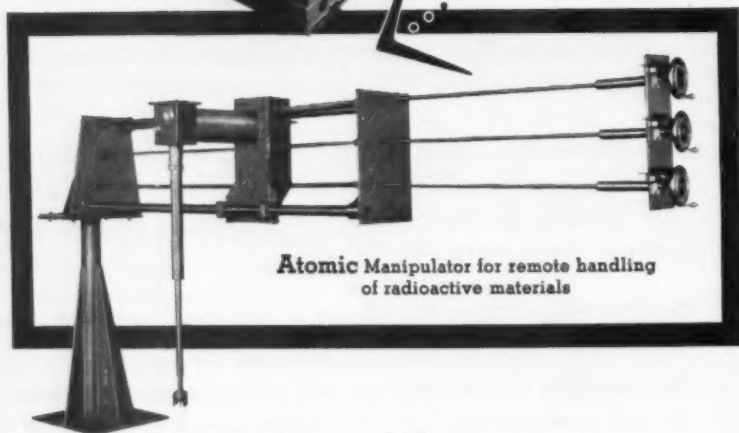
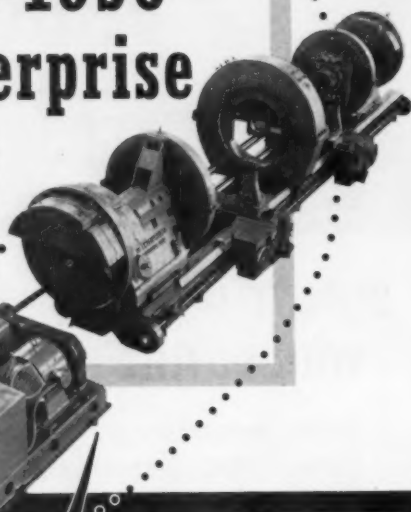
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FREE TECHNICAL LITERATURE

Handling

Better, easier, faster, safer and lower cost handling, storage and shipping is promised in a new folder. This, it states, is possible with a lightweight, maintenance-free pallet-container. The pallets are of corrugated alloy steel. They fold up for easy stacking and storage. *Hamilton Metal Products Co.*

For free copy circle No. 10 on postcard, p. 97

Torch

Especially designed for light duty work, a new torch can operate with a limited air supply. A data sheet advances its possibilities and explores its merits. Electrodes up to 1/4-in. in diameter can be used in this model, it says. *Arcair Co.*

For free copy circle No. 11 on postcard, p. 97

Hydrolubes

Physical properties of hydrolubes are reviewed in a 16-page booklet. It discusses advantages and limitations of water-base, fire-resistant hydraulic fluids. Installation and maintenance information appears. *Carbide & Carbon Chemicals Co.*

For free copy circle No. 12 on postcard, p. 97

Power transmission

Mechanical power transmission equipment is emphasized in a newly published guide. The 16-page illustrated booklet lists 739 different stock sizes of one manufacturer's quick-detachable sheaves. The wide range of sheave sizes listed extends from a sheave 3.4-in. in diameter and weighing approximately 2-lb, to a giant 6-ft sheave weighing about 1 1/2-ton. All sheaves listed are fully interchangeable with sheaves produced by other QD manufacturers. They fully meet standard industry tolerances recently adopted by the Multiple V-Belt Drive & Mechanical Power Transmission Assn. and the Rubber Manufacturers Assn. The booklet states: "Because of complete product interchangeability, plants can now standardize on the QD design without fear of interruption of supply and without having to depend solely on one source of supply."

Fort Worth Steel & Machinery Co.

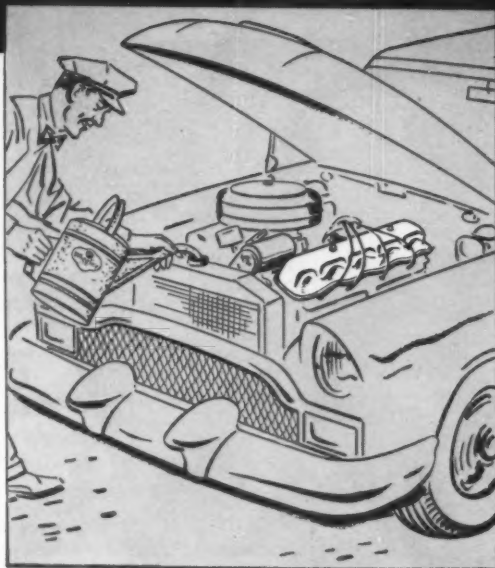
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November 29, 1956

95

WHAT ARE AMWELD FLASH WELDED RINGS?



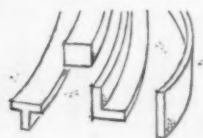
They are rings formed, flash butt-welded, and shaped into the finest quality circular weldments available.



They are rings that offer savings of critical materials. Bar stock formed and flash welded uses considerably less material than rings made by other methods.



They are rings that offer additional manufacturing savings. Since the rings are closer to the desired finished cross section, it is less expensive to machine them to a final dimension. Oh yes, Amweld will machine them for you.



They are rings made by a company with experience in design. We can help you select a mill-rolled or extruded shape that is even closer to the finished ring dimension. This can give you additional savings.



Yes, Amweld flash-welded rings can give you extra profit from savings on material and machining time. Amweld rings can be made of most weldable ferrous or non-ferrous metals in sizes from 4 to 96 inches.



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FREE TECHNICAL LITERATURE

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This section starts on p. 92.

Foundry material

Materials for covering, cleaning and degassing copper and nickel alloys are examined in a four page brochure. It discusses conditions under which alloys are melted. A rundown on compounds used for cleaning, covering and degassing is included. Instructions for its use, advantages, packing and a case history also are covered. *Foundry Services, Inc.*

For free copy circle No. 14 on postcard, p. 97

Milling

Bench and production milling machines are covered in separate folders. These brochures explain how the company's semi-automatic mill offers low cost production milling, while other units are available for bench operations. These machines are accurate, rugged and economical, they state. *Rotex Punch Co.*

For free copy circle No. 15 on postcard, p. 97

Hoist, pull unit

Lifting and pulling is the job of a new unit. A presently obtainable folder describes this hoister and puller. Several pictures show it in action pulling pipe sections together, placing equipment, spotting railway cars, loading vans, etc. *Griphoist, Inc.*

For free copy circle No. 16 on postcard, p. 97

Bearings

Containing 97 pages, a catalog lists thousands of rolling bearings and related equipment. It describes practically every type bearing. Engineering drawings and photographs and numerous tables and charts make the catalog easy to use. *Messinger Bearings, Inc.*

For free copy circle No. 17 on postcard, p. 97

Milling machines

Vertical milling machines for working metals requiring a high degree of rigidity and accuracy are described in an engineering bulletin. Rigid bed construction is an important feature. The table is designed so it cannot be twisted during clamping. It can be adjusted mechanically and by hand in both directions with a scale dial. Bulletin contains complete technical specifications. *Albert Klingelhofner Machine Tool Corp.*

For free copy circle No. 18 on postcard, p. 97

Forged unions

Dimensional and engineering data on forged steel unions for high pressure services is included in an eight-page bulletin. Types of unions described in the new bulletin are: 3000 lb forged steel unions, designed to AAR dimensional specifications; 2-bolt and 4-bolt flange unions in 2000 lb and 3000 lb classes; 3000 lb O-ring flange unions; orifice unions; tab orifice unions; clamp ring unions; forged stainless steel unions; forged steel unions with bronze-to-steel and stainless-to-steel seats; and lug nut unions. *H. K. Porter Co., Inc.*

For free copy circle No. 19 on postcard, p. 97

Materials handling

Profusely illustrated, a new catalog depicts uses of wirebound pallet boxes. It includes specifications on standard size pallet boxes, which satisfy most industrial needs. Smaller users, it states, also may obtain mass production economies with delivery direct from stock. *General Box Co.*

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FREE TECHNICAL LITERATURE

Foundry

Colorful catalog sheets contain many photos and interesting data on a foundry and machine corporation. They describe the firm's services, products and some methods. Covered are: laboratory test runs, annealing, machine molding, loam molding, precision machine show work, casting, quality control and more. *Kutztown Foundry & Machine Corp.*

For free copy circle No. 21 on postcard, p. 97

Brick

Refractory brick is the subject of a new eight-page catalog. It describes 19 standard brands produced by one firm. To simplify refractory selection, the catalog lists the "classification," "properties" and "applications" of each brand. Brief descriptions of each is included. *Richard C. Remmey Son, Co.*

For free copy circle No. 22 on postcard, p. 97

Taps

Standard and special taps, drills and gages are covered in a recently issued folder. It contains pricing formulas for determining the most economical quantities to purchase. *Beloit Tool Corp.*

For free copy circle No. 23 on postcard, p. 97

Welding positioner

Welding positioners for automatic and manual welding appear in a specifications sheet. It describes a model which is completely power-operated for both tilt and rotation. Also featured are table T slots for easy work clamping, and an adjustable elevating sub-base for clearing cumbersome weldments. *Worthington Corp.*

For free copy circle No. 24 on postcard, p. 97

Research services

One firm's research facilities are presented in a 12-page booklet. It explains that its services are available to industry on a contract basis for the first time in its 66-year history. Case histories of recent research and development projects are depicted. *The Fluor Corp., Ltd.*

For free copy circle No. 25 on postcard, p. 97

Aluminum use

Refrigerators contain more aluminum now. Its use is increasing. This is the conclusion of a current publication. It says refrigerator makers used about 72-million lb of the metal in 1955. The bulletin gives statistics and names refrigerator companies that have stepped up their aluminum usage. *The Aluminum Assn.*

For free copy circle No. 26 on postcard, p. 97

Relays, switches

About 40 different switches and relays are pictured in a dozen page pamphlet. These units range from standard size to miniature. Operation and characteristics of each is listed. The catalog also shows many new developments. *Jaidinger Mfg. Co.*

For free copy circle No. 27 on postcard, p. 97

Sanitary pump

Sanitary liquid end controlled volume pumps are announced in a recently published folder. It illustrates the sanitary liquid end's construction and its easy disassembly for thorough cleaning. A typical application is also depicted. *Milton Roy Co.*

For free copy circle No. 28 on postcard, p. 97

Instruments

Concise information about compact, electronic indicators and recorders is presented in a new data sheet. It covers instruments for rotational or linear speed measurements and tachometer generators used with them. *Leeds & Northrup Co.*

For free copy circle No. 29 on postcard, p. 97

Brazing alloys

Descriptive literature is available on high temperature brazing alloys. The brochure gives specifications, selection factors, recommended applications, and other pertinent data on four alloys. These are basically nickel alloys having nickel contents ranging from 72.5 to 93.25 pct. It also describes a six-step procedure for obtaining high quality joints with these alloys. *Handy & Harman.*

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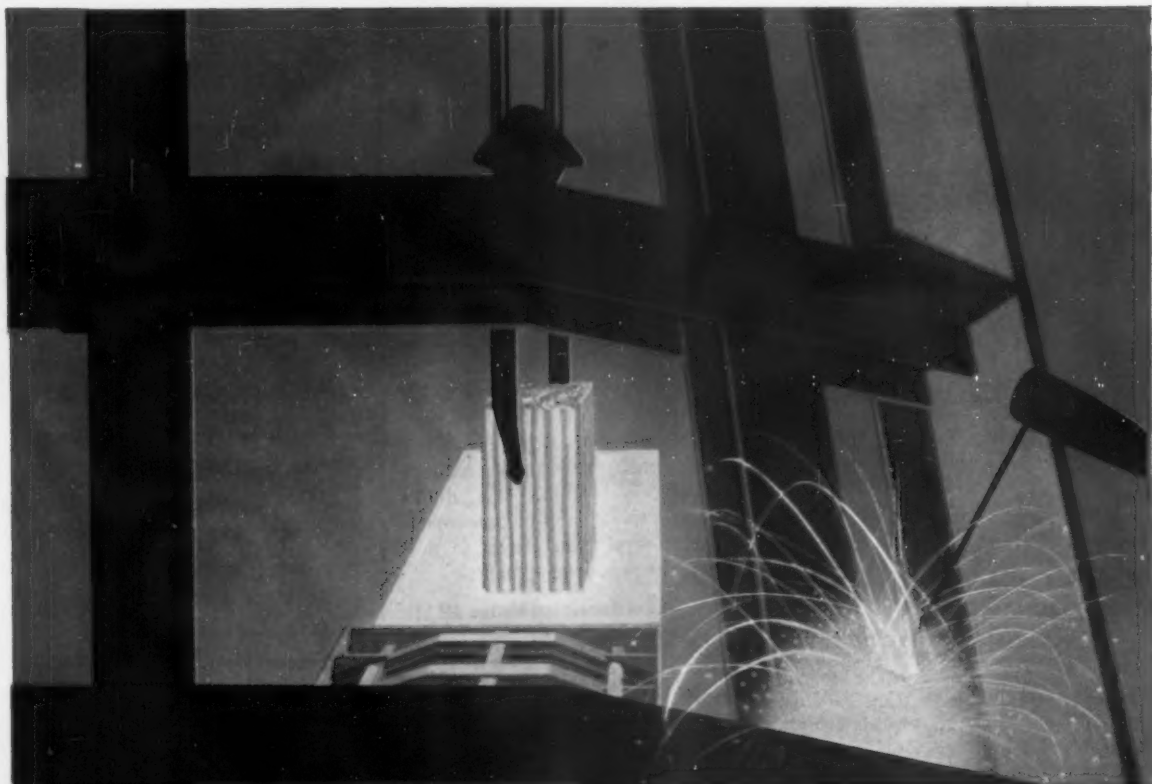
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This soaking pit cover for a leading steel producer—detailed and fabricated by Levinson—was actually set in place 13 days ahead of schedule.

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EXCLUSIVE
MANUFACTURERS OF
Stop Nuts

TECHNICAL BRIEFS

MACHINING: Countersinker

Jet planes contain thousands of flush-driven rivets and screws . . . Plane makers are intolerant about tolerances, so they use a "home made" countersinker for accuracy.

Take a standard air feed drill; place it in a housing which will give it universal maneuverability in the working area; add a self-aligning device near the drill's working end; apply pneumatic pressure, and you have a new countersinking development.

Countersinks Exact Depth

This is the recipe cooked up by the Glenn L. Martin Co., Baltimore, Md., to solve two problems. These are: countersinking to correct depth and keeping the drill at exactly 90° to the skin's angle.

The wing skin and fuselage of high speed jets made by the company contain thousands of flush-driven, flat-head rivets and screws. Each hole must be countersunk to a very close tolerance. At supersonic speeds, even a few thousandths of an inch protrusion is unsound. The countersink, thus, must be exactly perpendicular to the skin's surface, and the cut's depth must be precise.

The self-aligning feature consists of a gimbal attached to a standard Airfeedrill. It is composed of a metal ring approximately 6-in. in diameter and the Airfeedrill holder. Three microswitches are located in the nose of the drill holder. These control a solenoid which, with suitable linkage to the valve, actuates the drill's on and off operations.

Magnet Locks Drill

The unit is supported by arms from a base. A magnet locks the drill in position and an air cylinder presses the unit against the frame.

In use, the operator moves a vertical handle starting the air cylinder. This presses the unit against the skin and causes the

WANT MORE DATA?

You may secure additional information on any item briefed in this section by using the reply card on page 97. Just indicate the page on which it appears. Be sure to note exactly the information wanted.

drill to move to a 90° normal position. The microswitches contact the skin during this operation and actuate the magnet and solenoid. However, all three microswitches must make contact at this time; if one switch loses contact because



Setup keeps the drill at a 90° angle to the skin.

of a deviation of the drill from the exact 90° angle, the switch opens and stops the drill.

Under the thrust developed by the drill, when the proper depth has been reached a pressure pad on the countersink forces the unit away from the skin, thus opening the microswitches and stopping the drill.

Handling:

Self-dumping hoppers cut handling time.

All bulk materials handling at North Chicago Refiners & Smelters, Inc., North Chicago, Ill., is accomplished with self-dumping hoppers transported by fork-lift trucks.

Scrap used in making brass and bronze ingots, copper anodes, zinc die castings and other alloys is



Self-dumping hoppers carry 5000-lb of scrap or materials.

received in rail cars or trucks. It is then unloaded into hoppers and carted to segregated storage bins. Hoppers are also used to carry materials from bins to the furnace when a heat is made up.

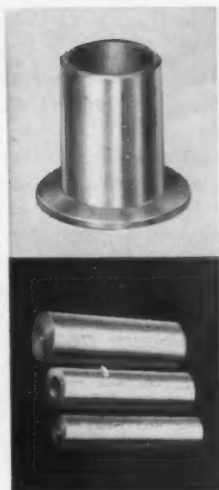
Finished ingots are carried in hoppers to storage areas or directly to the shipping dock. Reinforced hoppers will carry 5000-lb or more. The company reports that the unit's self-dumping action speeds up handling time while requiring no maintenance.

Metals:

Vacuum arc melting furnace has 12-in capacity.

A 12-in. capacity vacuum arc melting furnace for production melting of molybdenum and molybdenum alloys is being installed at the Universal Cyclops Steel Corporation, Bridgeville, Pennsylvania plant.

The consumable electrode vacuum arc furnace produces high-



THE *Simplest Answer* TO YOUR BEARING PROBLEMS

The availability of oil-filled, self-lubricating sintered powdered Bronze Bearings is greatly enlarged by the many sizes that are included in the new Bunting Standardized sintered Bronze stock line. Chemical and physical specifications of these Bunting stock bearings are ASTM-B202 Type I, Class A. The material also meets the requirements of SAE Type I Class A, AMS-4805 and MIL-B-5687A Type I Comp A. The basic composition is 90% copper and 10% tin of high purity.

This high quality powdered bronze with built-in lubrication together with Bunting Cast Bronze Bearings made of Bunting No. 72 Bronze (SAE-660) give mechanical production and maintenance the means of finding the simplest, best and most economical answer to any bearing problem.

BOTH Bunting Cast Bronze and Bunting oil filled, self-lubricating sintered powdered Bronze Bearings and Bars are available to you through your nearest Bunting Distributor. He has in stock all sizes for your immediate needs. Ask him or write for complete lists and dimensional data on Bunting Cast Bronze and Bunting Sintered Bronze Bearings.



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temperature metals and alloys. Its initial work will be with molybdenum. The furnace can also be used for iron or nickel base alloys, titanium and zirconium.

Removes Gas Impurities

This type melting furnace was chosen because very pure, high-quality ingots are required. It not only eliminates impurities from the atmosphere but also removes gaseous impurities at melting

temperatures, reduces segregation and produces a superior grain structure.

Rated as a 12-in. furnace, the unit will also handle 8, 10 and 16-in. diam. ingots. It has a maximum length of 5½ ft and weighs from 850 to 5000-lb. The furnace was designed and built by the General Electric Company's Industrial Heating Department, Shelbyville, Indiana.

The furnace consists basically

of three sections: electrode housing, water-cooled copper crucible and a transition section. This joins the electrode housing, vacuum system and power supply with the supporting structure.

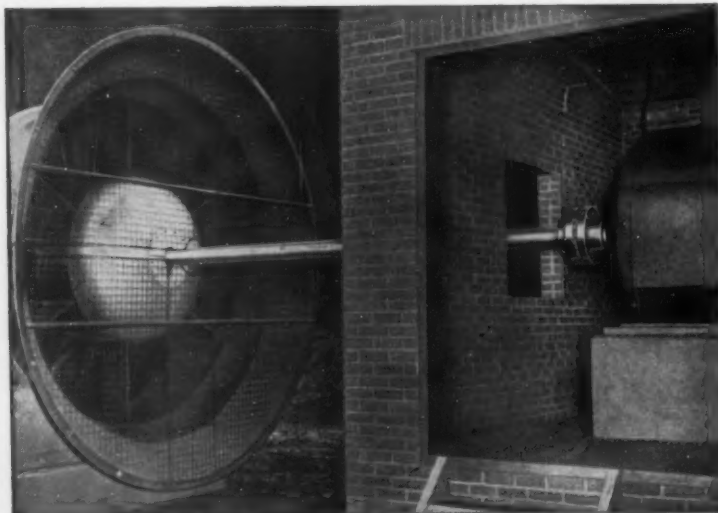
The vacuum arc melting process is like arc welding on a grand scale. Instead of laying a bead between two pieces of metal, however, a very heavy bead is laid vertically in a water-cooled copper crucible which forms a round ingot. During the operating cycle, a high capacity vacuum system removes gaseous impurities at melting temperatures. Because of the vacuum system, the electrode is enclosed in a water-cooled tube.

Produces A 2000-lb Ingot

As the "bead" solidifies progressively from the bottom of the crucible, the molten pool on top floats non-gaseous impurities to the surface. These impurities are cropped off the top of the ingot at conclusion of the melt. Progressive solidification of the ingot tends to align the grain growth parallel to the length of the ingot.

The furnace will produce a 2000-lb ingot every five hours. This includes about two hours' melting time, one and one-half hours for ingot removal, and one and one-half hours for preparing furnace for the next melt.

Eliminate Intermediate Bearings!



By using Thomas Flexible Couplings on long, unsupported shafts, intermediate bearings are eliminated. Thomas engineers tubular shafts free from lateral whip.

The large fan shown above is 16' from the motor to allow sufficient air intake. Miners working underground receive their fresh air supply from this fan and others like it,

which have been giving dependable service for as long as fifteen years... without shutdowns for lubrication or maintenance of the couplings.

Thomas floating shaft flexible couplings are recommended for machine and marine drives, printing presses, paper and cement mills, cooling towers, diesel engines, pumps, compressors, and many other uses.

Only Thomas Flexible Couplings offer all these advantages

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| 1. Freedom from Backlash— | Constant Rotational Velocity |
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THOMAS FLEXIBLE COUPLING COMPANY

WARREN, PENNSYLVANIA, U.S.A.

Methods:

Wire, strip calculator determines weight.

A handy calculator offered by National-Standard Co., Niles, Mich., makes it easy to determine the weight of springs made from given sizes of round wire or flat stock.

The calculator is of the circular slide rule type, with one side for round wire and the other for strip.

To calculate the weight of pieces fabricated from round wire, the rotating disc is set on the diameter scale, which ranges from 0.005 to 0.250-in. The weight, in pounds per thousand pieces, is read opposite the lengths of the

wire. Length is given on a scale ranging from 1/2 to 50-in.

To determine the weight of pieces fabricated from strip, the width of the piece is set opposite the thickness. Weight in pounds per thousand pieces is read on the outside scale opposite the length. Weight of strip ranging from 1/16 to 25-in. in width, 0.001 to 0.300-in. in thickness, and 1/2 to 100-in. long can be calculated.

Power:

Scale model reactor uses liquid metals.

A scale model nuclear power generator uses hot liquid metals to generate steam from sodium or sodium-potassium cooled reactors.

One of the model's features is double tube construction. Combined with double tube sheets, this forms two barriers to separate the liquid metal from the water and steam generated. This is impor-

tant with alkaline metals, such as molten sodium, or sodium-potassium metals. These metals react vigorously with water, forming the explosive gas hydrogen.

The heat is transferred from the hot liquid metal inside the chrome-moly steel inner tubes. These tubes are expanded tightly into the outer tubes. Heat is transferred from the inner tube to outer tube by conduction. Outer tubes are welded into tube sheets which form a part of the steam chamber or shell.

If either tube should break in service, or any tube joint should fail, the fluids would flow into an intermediate chamber formed between the two tube sheets. Fine grooves are formed on the outside of the inner, or liquid metal tube, or on the inner surface of the outer, or steam tube.

Griscom-Russell Co. is constructing these units at its Masilon, Ohio, plant.

Handling:

Scales built into crane reduce weighing time.

By building scales into its materials handling crane, an aluminum fabricating firm reduces its inventory control weighing by more than 40 pct. The crane weighs materials while it moves them from one processing bay to the next.

Placed Between Boom & Load

Channel Master Corp., Ellenville, N. Y., installed Baldwin SR-4 crane scales on its 3-ton traveling crane. Placed between the boom and the load, the scales record weight on a meter located in the cab. This scale dial reading is then read by the operator to the rigger, who records it.

Formerly, the crane picked up a bundle of tubes at one processing point, ran it to platform scales,



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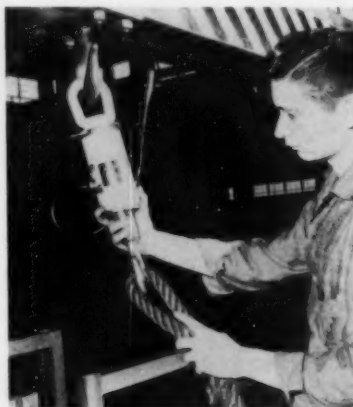
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SHEET METAL FABRICATION

TECHNICAL BRIEFS

lowered it to position where the tubes were balanced and weighed. Then it was delivered to the next processing point. The company estimates that each of the two or three times the tubes were weighed during processing, it lost about three minutes of production time.

Weighing Takes 60 Seconds

Under the new system, weight is taken in half a minute. The crane operator lifts the bundle of tubing at one department. He pauses when it is clear and re-



Rigger detaches a bundle of tubing from a crane scale.

ports his readings to the rigger. The rigger records the weight on a job ticket and punches it on a tag attached to the bundle. Tubing is then moved directly to the next processing department.

Two 2500-lb capacity crane scales made by Baldwin-Lima-Hamilton Corp., Waltham, Mass., are used. Scales are attached to hooks on the boom by their top rings. Lines with which the bundle is lifted are attached to hooks at the bottom of the units. The full weight of the tubing, from 1000 to 2000 lb per bundle, is carried by the Baldwin units.

Load Cells Register Weight

The scales communicate weight, through electric cables, to the scale dial in the cab of the crane operator. Here, the weights registered on the two load-cells are automatically added, the tare

weight of lifting cables and hooks deducted, and the net weight reported on the dial.

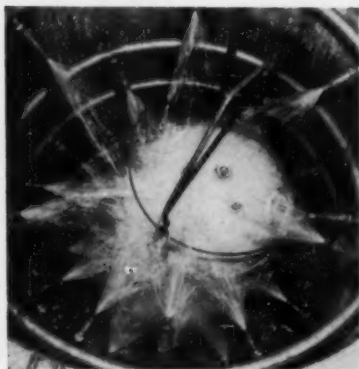
The 20-ft boom, which hangs from the crane hook, is made of two channel-irons bolted back to back and equipped with 10 hooks. These hooks permit the rigger to move the load-cells to adjust for variations in length, from four to 28 ft, of tubing handled.

Heat Treating:

How do you quench a hot, buoyant metal balloon?

Natural buoyancy of a large heated tank posed a problem for engineers working on the Vanguard satellite project. Normal procedure called for heat treatment and a fast quench. However, the usual tub cooling was ruled out. The tank's size and buoyancy made it very difficult to keep submerged.

The tank is one of several being made by the Glenn L. Martin Co., Baltimore, for the Vanguard Earth-satellite launching vehicle,



Water sprayed from nozzles cools this heated, buoyant tank.

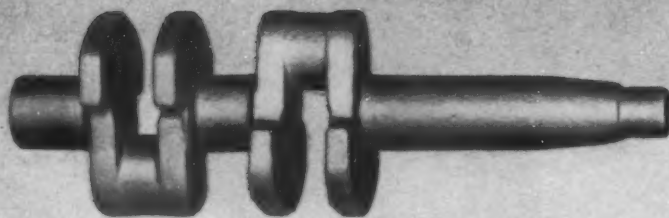
a three-stage rocket which will carry the first satellite to its orbit. These high-pressure tanks are constructed of corrosion-resistant steel.

Tanks produced for this program are heat treated to 970°F, followed by quick cold quenching. Quenching is done in a shower bath consisting of many nozzles attached to a circular pipe around

How often do you find a flaw in a coin?



...or in a FORGING?



(Both are made by the same basic process)

When closed impression dies strike a coin, or hammer out a forging, they produce a result that gives specific advantages — freedom from concealed flaws, closeness to tolerance, strength without bulk, superior resistance to impact and fatigue stresses. These advantages mean fewer part rejects, greater overall economy, better product dependability and performance. These advantages are all found in forgings, the metal you can trust.

Do you have a part design problem? Are you now purchasing parts, made by other processes, which require extra metal to provide strength? Are you using weldments, or fabricated assemblies? You will find that often forgings can eliminate extras, and yet give you quality-plus advantages.

Make it a point to call in a forging engineer to learn more about how up-to-date methods and techniques of forging can help to reduce your products or part cost.



Reduce your cost by using forgings. Send for booklets, ☐ "What is a Forging?" and ☐ "Management Guide to the Use of Forgings."

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Photo above indicates the heavy construction of bed plates—reinforced to provide maximum rigidity and minimum deflection.

SPECIFICATIONS

Ram Speeds — in./min.	18
Cylinder Bore — in.	7
Ram Stroke — in.	12
Daylight — in./max.	42 1/4
Opening, L-R — in.	45 1/2
Between Bed Plates	11 1/8
Motor, H.P.	7 1/2 / 220 / 440-3-60
Shipping Wt. — lbs.	3025

STANDARD EQUIPMENT

1 pair notched V blocks; 1 pressure gauge, dual range P.S.I. and tons on ram; 1 bed adjusting mechanism; 1 flat ram nose; 1 auxiliary 2-speed hand-pump.

You won't have to baby this husky K. R. Wilson hydraulic shop press. Built to tackle the toughest jobs, it's the most rugged standard press of its type available. Heavy-duty, spring-return ram type hydraulic cylinder has a larger bore and longer stroke. This allows the press to handle the big jobs swiftly and safely with a minimum of bed plate adjusting. You get tremendous versatility too! The large, usable daylight opening between side members allows straightening of long pieces. Pressing bushings, shafts, wheels on and off, broaching, bending, coining, forming and drawing operations all can be handled with equal speed and ease. K. R. Wilson Motor Operated Hydraulic Shop Presses are also available in 30, 50 and 75 Ton Capacity. Get all the facts now on these rugged presses!

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TECHNICAL BRIEFS

the inside walls of an ordinary tub.

The heated tank is lowered into the tub and water is sprayed on it from all sides. This simple method cools the tank quickly and evenly. It eliminates use of any complicated submersion apparatus.

New Films:

"Transformers in the Making," shows progressive steps in the manufacture of power and distribution transformers including tank fabrication, coil winding, assembly, testing and shipping. Final scenes, taken during the installation of a large power transformer, stress the importance of adequate field service. 27 1/2 minutes. 16mm color. Wagner Electric Corp., 6400 Plymouth Avenue, St. Louis 14, Mo.

"Material Handling" series contains slide films of 400 photographs of material handling equipment in actual operation. The slide film is in strip form. Included in the action shots are lift trucks, hand trucks, attachments, conveyors, unit loads, pallets, containners, hoists, monorails and all other current types of equipment shown in a wide variety of handling operations. \$15.00 a set (\$10.00 to colleges). College-Industry Committee on Material Handling Education, 8444 South Yates Avenue, Chicago, 17.

"The Petrified River—The Story of Uranium" covers the story of uranium in the U. S. from prospecting for ore to the peaceful uses of atomic energy and radioisotopes. A pilot "rim flies" his small plane through a canyon, while his geologist passenger searches the walls with a radiation detecting scintillometer. Other prospectors, on foot, climb the slopes like prospectors of old, probing for the treasure with pick and Geiger counter. Then come bulldozers to gouge out roads for ore trucks, and jack hammers and drills to pry the uranium ore from sub-surface rock. Extracting and purifying of ore are shown at an ore-treatment plant. An animated

sequence shows how the elements of nature were created, the formation and splitting of the uranium atom, and the way an atomic power station works. Scenes shot at the Oak Ridge National Laboratory show the loading of a uranium graphite reactor, the irradiation of isotopes, and the complex manipulating equipment being used to handle radioactive materials. 28 minutes. 16mm color. Graphic Services Section, U. S. Bureau of Mines Experiment Station, 4800 Forbes Street, Pittsburgh 13.

"Bright Steel," describes the manufacture of quality tinplate and backplate. Filmed at Bethlehem's Sparrows Point, Md., plant, it details the production of versatile tinplate and its use in canning, bottle capping and other industries. The film was cited with an award at the recent Cleveland Film Festival for its graphic picture of industrial processes. 29 minutes. Color. Modern Talking Picture Service, Inc., 3 East 54th Street, New York 22.

"Optical tooling," a new method of measuring, positioning, and aligning, is presented by means of animated drawings and working models of optical instruments and tooling bars. In addition to explaining the basic theory of optical tooling, it illustrates specific industrial applications in research, design, and production. Automobiles, airplanes and other models are used with set ups of optical tooling equipment to illustrate these applications. 35 minutes. 16mm color. Charles Bruning Co., 4700 Montrose Ave., Chicago 41, Ill.

"Quality Unlimited," is a new sound-color film describing wire rope manufacture. It follows all production operations from basic steel making to testing finished rope. Emphasis is given to chemical and physical tests that accompany manufacturing and quality control. Applications and proper care of wire rope are illustrated. 30 minutes. Color. Colorado Fuel and Iron Corp., 575 Madison Ave., New York 22.

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AND EMULSION CLEANERS • PHOSPHATE COATING PROCESSES**

NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies... for more data use the free postcard on page 97 or 98.



Device allows visual inspection of screw machine parts

This device provides a reliable, convenient and high-speed method of inspecting the finish and other details of screw machine parts and similar work up to 3-in. diam. Its lens provides almost instant focus on both large and small fields and flat and curved surfaces. The wide diameter lens allows use of both eyes. Critical inspection can be made from all angles and at casual

distances from it. The light source provides a highly efficient, uniform illumination. It has no focusing devices; no holders are required for material being inspected. Streamlined design allows work to rapidly pass under the glass. This speeds up inspection. It is regularly supplied with a 25-w lamp for 115-120v. *Eastern Machine Screw Corp.*

For more data circle No. 31 on postcard, p. 97

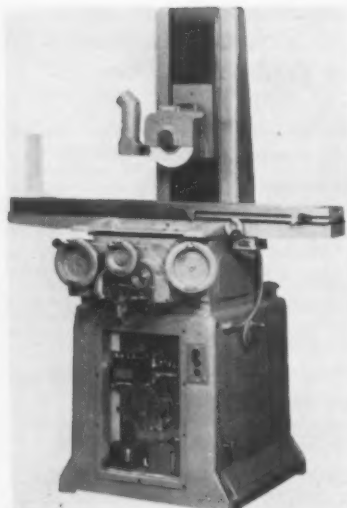


Lapping machine's abrasive tank is easily removable

This detachable abrasive tank cuts maintenance and abrasive re-fill time on one maker's automatic lapping machines. It permits precision flat lapping of piece parts on almost a non-stop production basis. Detaching the complete tank requires the loosening of only three screws. Electrical connections which supply current for the agitator motor and the electric solenoid can be instantly disconnected by a

simple twist of two connections. This permits operators to clean the abrasive tank, feed line and visible sight gage in little time. The solenoid valve is part of the tank; it may also be cleaned in moments by pressure cleaning with an air hose. The lightweight aluminum tank cover also is removable with the loosening of only three screws. *Spitfire Tool Co.*

For more data circle No. 32 on postcard, p. 97



Precision surface grinders offer simple operation

Precision surface grinders offer simplified operation. Rugged and reliable, they are available with a powered table and powered crossfeed. Some models have powered table and hand-fed crossfeed. Others are fully hand-fed. The reciprocating table is driven by a cogged timing belt, providing a positive non-slip drive. It eliminates chain chords on finished work. A newly designed crossfeed operates within 1½-in. of the end of the stroke in both directions. This results in better surface finish. Crossfeed is adjustable from 0.006 to 0.100-in. Rear cross slide ways are guarded for protection

against grit, as are the under sides of the table ways. Elevation of the self-contained motorized grinding spindle is easier, through the addition of ball bearings to the elevating shaft. This control, as well as crossfeed and table traverse, is located at fingertip level for easy operation. Grinder's floor space is 71 x 43½-in.; weight, 2200-lb. The carriage type motorized spindle is 1-hp; table traverse motor, ½-hp. Work capacity measures 6 x 18-in. The work table is 51 x 8-in. overall. Electrical requirements are: 220 v, three phase, 60 cycle. *Reid Brass Co., Inc.*

For more data circle No. 33 on postcard, p. 97



Here's proof of Hi-Qua-Led's performance in ALCO seamless forged and rolled rings:

- "Roughing cuts reduced by $\frac{1}{2}$
- ... cutter costs by $\frac{1}{4}$
- ... running time by 12 $\frac{1}{4}$ hours
- ... surface finish: greatly improved"

Tremendous savings in machining time and reduced tool costs are reported by our ring customers who have used ALCO's new Hi-Qua-Led Steel*. Here's what one customer reports:

"The leaded steel machined successfully using half the normal number of roughing cuts and at greatly increased speeds. Surface finish was greatly improved. Normal surface finish on 4140 steel was from 80 to 125 rms, while surface finish on the two test gears was from 40 to 60 rms. Total running time per gear was reduced by 12.18 hours. Cutter costs were reduced by approximately one-third."

Make the comparison right in your own shop. Let ALCO furnish you a trial lot of Hi-Qua-Led steel rings along with your usual grade. See the advantages it brings in faster machining, with less power, reduced tool wear. Hi-Qua-Led may be obtained in any size ALCO forged ring. For complete information contact your nearest ALCO Sales Office.

*Trade-mark Reg. applied for. Patent applied for on lead-addition method.

Other customer tests of Hi-Qua-Led's machinability are equally impressive:

- **41L37 — Brinell Hardness 290-330**

Turning — Speed increased from 2 $\frac{1}{4}$ rpm to 6 rpm. Depth cut: from $\frac{1}{4}$ in to $\frac{3}{16}$ in. Machining time improved: 69 per cent.

Teeth-Cutting — Tool life increased 1600 per cent. Tool wear decreased 95 per cent.

- **41L40 — Brinell Hardness 285-302**

Turning — Speed increased from 17 rpm to 25 rpm. Machining time improved 47 per cent.

Teeth-Cutting — Tool life increased 427 per cent. Tool wear decreased 77 per cent. Machining time improved: 41.2 per cent.

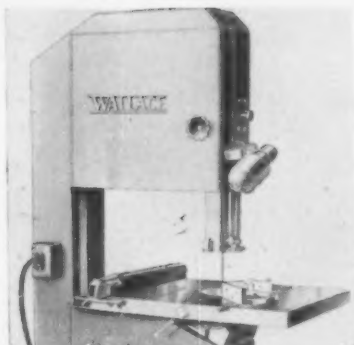
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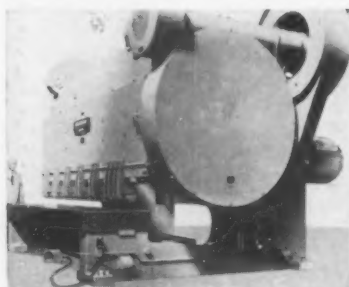


Heavy duty 18-in. bandsaw works nonferrous metals

Suitable for use on nonferrous metals, this 18-in. bandsaw features welded steel frame construction. Operator convenience is stressed. All adjustment handles are easily accessible. A large removal throat piece permits adjustment of the lower blade guide from above the table without opening the machine's lower door. It is available in a straight belted drive (high speed range) and also in a

combination version that permits a full range of cutting speeds from 50-ft per minute to 3800-ft per minute. The low speed range is obtained through use of a simple gear reduction unit built into the lower wheel of the bandsaw. A universal-type motor mount permits use of any desired horsepower from 1/2 to 2-hp. *J. D. Wallace & Co., Inc.*

For more data circle No. 34 on postcard, p. 97

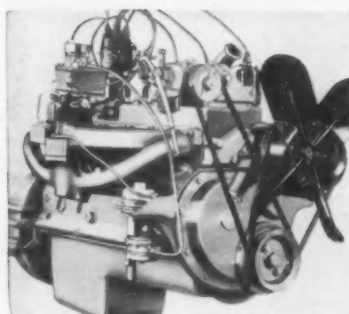


Machine shears 1 1/2-in. mild steel plate

Mild steel plate 1 1/2-in. by 12-ft is sheared with a new high capacity machine. This is the largest capacity of any unit ever constructed by its builders. It features all-steel interlocked construction. With a 36-in. throat, the shear possesses a high pressure hydraulic hold-down system. It has front-controlled power-operated back gage

with a 48-in. range. Clutch control is of the air-electric type. Ball transfers are in the table. Micrometer accuracy in shearing is maintained at an operating speed of 15 strokes a minute. Special modifications of this and other standard shears are available from the company. *Cincinnati Shaper Co.*

For more data circle No. 35 on postcard, p. 97

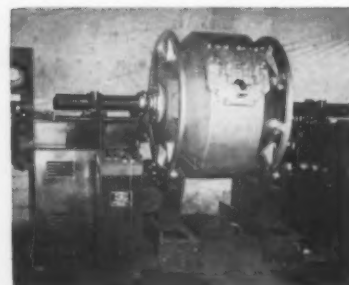


Six-cylinder engine tackles heavy-duty industrial jobs

Designed to produce high torque at low speeds, a new six-cylinder engine is recommended for industrial use. Key points are reinforced for extra durability. The engine has passed repeated 100-hour tests at 4000-rpm under a full load. There were no parts failures or breakdowns of any kind. Valves have hard faced Stellite or Eatonite material. This reduces valve

warpage, seat distortion and valve burning. Pistons are aluminum alloy, each with a control band. The band is cast into the piston around the skirt, avoiding possible piston skirt collapse. Piston slap and high oil consumption are cut down by the control band. Each four-ring piston has a chrome top compression ring. *Willys Motors, Inc.*

For more data circle No. 36 on postcard, p. 97



Indirect arc furnaces embody fully motorized controls

Indirect arc furnaces embody new design, engineering and operating features. They are pedestal mounted, with a completely new arc control system and motor-driven electrodes. A magnetic amplifier type arc control permits variable control motor speed. This directly proportions its speed to unbalance. Motor-driven electrodes are automati-

cally controlled. They may also be moved by manual pushbutton controls while recharging or for electrodes positioning during automatic operation. All switches, pushbuttons and indicating lights are contained in a single box. This can be placed at any convenient location. *Kuhlman Electric Co.*

For more data circle No. 37 on postcard, p. 97



Atomic flashlight provides light without batteries

An atomic flashlight gives off light bright enough to read a map. Without aid of batteries or external power sources, the flashlight will provide this illumination for many years. A non-hazardous radioiso-

tope powers it. It's made in a variety of light outputs and colors, and can be produced in any size and shape. *New England Nuclear Corp.*

For more data circle No. 38 on postcard, p. 97



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NEW EQUIPMENT

Arc weld electrodes have iron powder coatings

Mild steel arc welding electrodes with iron powder coatings result in improved weld quality. This is particularly so in root passes, say its developers, because of the reduction in size of the "wagon tracks" usually formed in mild steel welding. As a result of iron powder action, slag offers no interference in confined joints or vertical down

welding, and removal from the surface and edges of deposits is easy and complete. Actual test results on the new electrode, obtained in a plate welded with 3/16-in. diam, at 175-amp, dc reversed, showed a range of 63,900 to 64,500 psi ultimate, 52,600 to 53,450 psi yield, *Welding Dept., General Electric Co.*

For more data circle No. 39 on postcard, p. 97

Spot welder weighs 58,000-lb, has 2100 sq in. throat

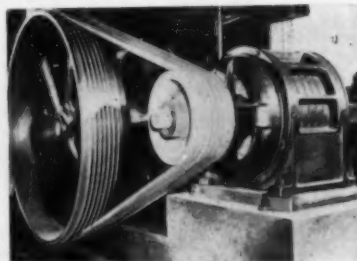
Reaching over 13½-ft in the air, a three phase frequency converter spot welder weighs over 58,000-lb. It is designed with a special throat on work clearance area of approximately 2100 sq in. to accommodate a portion of the tail section of a large commercial jet airliner now under construction by one of the country's leading aircraft companies. A three-phase unipolar transformer supplies the 100,000 amperes of welding current. It weighs over 25,000-lb and required the development of entirely new

construction techniques. The machine is one of several units presently being made by the manufacturer. The many special features built into this machine were required in order to produce a resistance spot weld meeting specifications exceeding those required by military specifications for aluminum aircraft structures. *The Federal Machine & Welder Co.*

For more data circle No. 40 on postcard, p. 97

V-belt

Increased power transmission and low maintenance on multi-V-belt installations are key features of a new high capacity V-belt. The belt is available in all standard sizes.



It features an oil resistant cover to prolong its life. Belts can be furnished with static conducting covers. They are manufactured with nylon laminated, and heavy rayon grommet construction. Its makers report that the belt has up to 40 pct more strength than standard belts. Thus, lower drive costs can be achieved since fewer belts and narrower sheaves are required to handle a load. One drive formerly using 13 standard belts was redesigned to use only nine high-capacity belts, reports the manufacturer. *Thermoid Co.*

For more data circle No. 41 on postcard, p. 97

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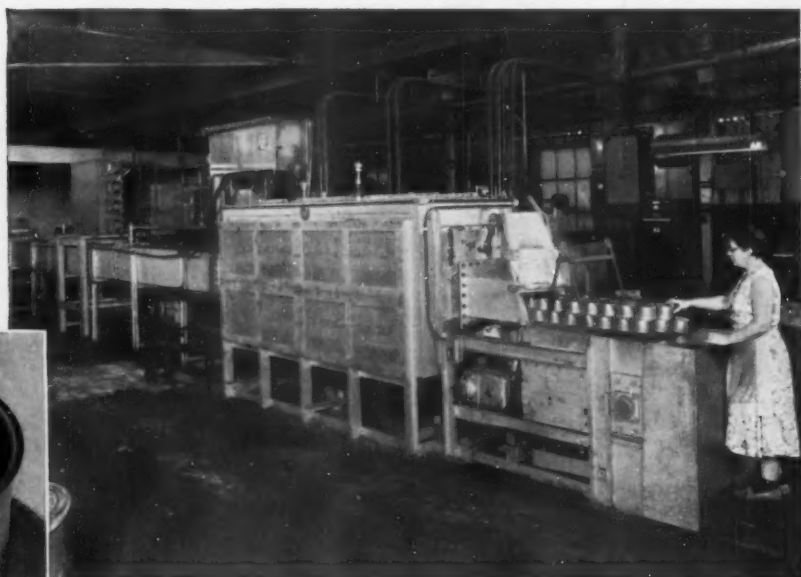
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Harper 135KW, 16" Mesh Belt Furnace in use brazing 600 pieces per hour of the power steering reservoir shown at left. Temperature 2100° F. Silicon carbide elements divided into 3 zones for flexible heat control.

Reliable Metallurgical Service in Cleveland is thriving for only one reason: they are able to produce high-quality copper-brazed steel parts at a price which not only saves real money for their customers but which is also competitive with other custom-brazing plants.

Says metallurgist G. H. (Whitey) Griffiths, President of Reliable: "In custom brazing work, we must sell our furnace time at a profit and still be competitive. Our Harper mesh belt furnace consistently produces uniformly bright, quality work at a low cost and with few rejects and minimum down-time. That's all I want in a brazing furnace."

In this highly competitive business, furnace costs are watched carefully because a fraction of a cent per

part may make the difference between getting and losing a large order. And one of the reasons why Reliable and many other manufacturers choose Harper mesh belt protective-atmosphere furnaces is the low overall cost resulting from the use of silicon carbide heating elements. The high concentration of power in these elements means up to 50% more productive capacity for a given size furnace. Also, with proper operating procedures these efficient elements give good life, and when necessary, replacements can be made quickly and without appreciable down-time.

Check Harper brazing furnaces before you buy. As a starter, mail the coupon today for your copy of bulletin "Harper Mesh Belt Conveyor Furnaces".



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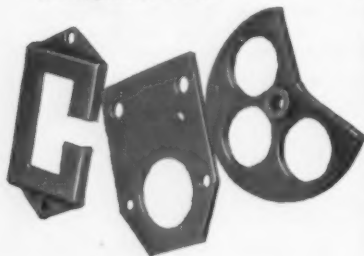


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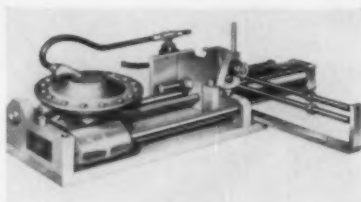
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VULcan 3-7900

NEW EQUIPMENT

Coil feeder

Air-operated units for feeding coiled stock into punch presses move easily from press to press without time consuming effort. They involve no expensive attachments and mount directly to the press' bolster plate. The only other

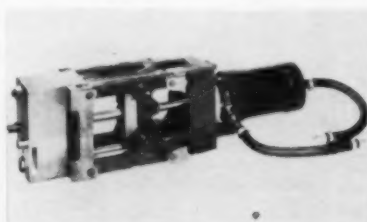


tie-in is a valve mounting. Available for stock widths of 8, 12, and 18-in. and feed stroke lengths of 8, 12, and 18-in. the air feed units are adjustable for both width and stroke length from their maximum to zero. Width adjustments can be made in a few minutes. No adjustment is necessary for stock thicknesses. *Special Engineering Service, Inc.*

For more data circle No. 42 on postcard, p. 97

Portable toggle

A new, more massive toggle mechanism can be adapted to small, high-speed DCMT diecasting machines. It is interchangeable with all existing units. The unit has a more massive air cylinder, a stronger and larger ejector box permitting ejection over the complete area of maxi-



mum size 9 x 9-in. die blocks, and heavier duty toggle links. Die blocks have bushing supports for fitting onto the pot, permitting nozzle burner flames to play on the nozzle without interference from support. The toggle mechanism is designed for easy and simple maintenance. *DCMT Div., British Industries Corp.*

For more data circle No. 43 on postcard, p. 97

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is only 79 in. Power steering is standard equipment. Capacity is 4000-lb at 24-in. load center. The engine has 48.2 hp. Other features: rugged Timken power axle, oscillating rear axle, maintenance provisions and a loaded travel speed of 9.5 mph. It has hydraulic brakes, two speeds forward and two speeds reverse. *Baker-Raulang Co.*

For more data circle No. 44 on postcard, p. 97

Booster-bar

A new accessory booster-bar permits measuring greater center-distances with center-mike hole-location gages. There are booster-bars for three standard center-mike sizes. The largest booster-bar adds 9-in. to the measuring range of a center-mike, raising it from 12.4-in. 21.4-in. Each booster-bar assembly has two precise-length rods held in plastic brackets that are slotted to hold the center-mike in the second step of the measuring sequence. *Sorensen Center-Mikes, Inc.*

For more data circle No. 45 on postcard, p. 97

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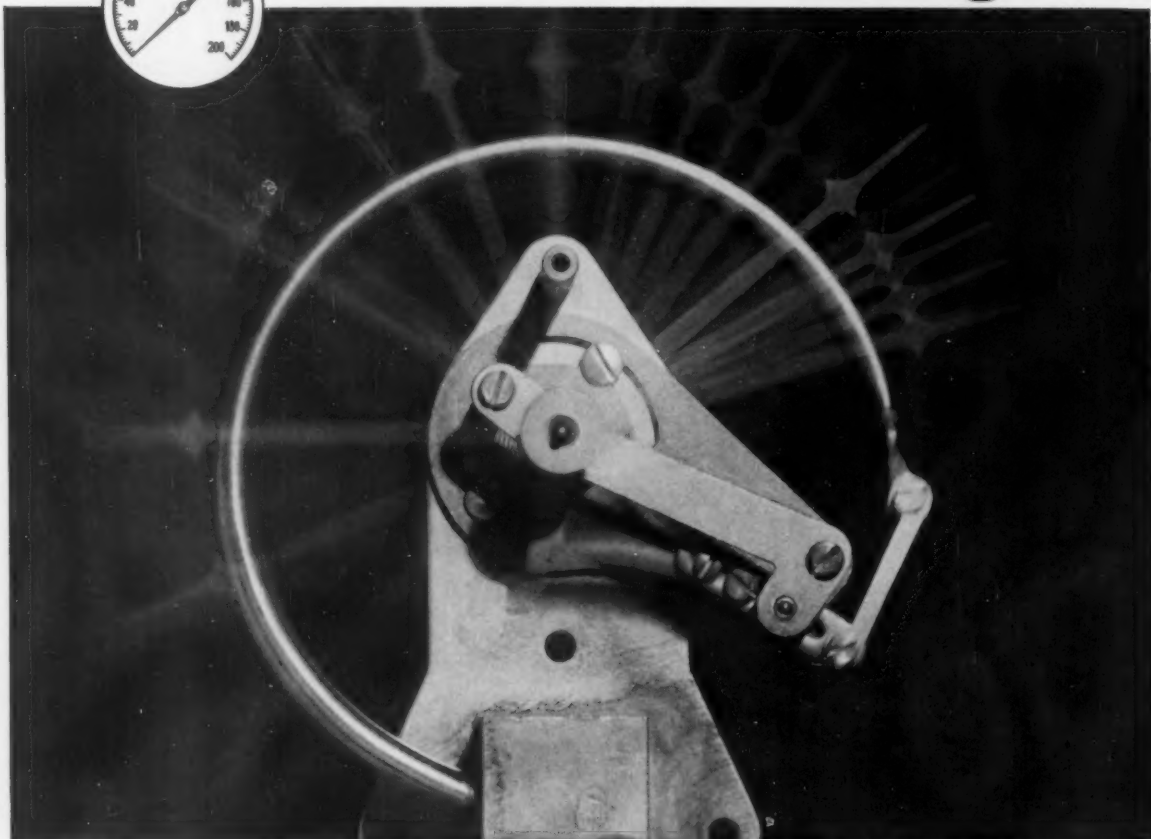


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Beryllium copper tubing by Superior has this and many other important characteristics to a marked degree, such as hardenability, corrosion and fatigue resistance, thermal and electrical conductivity. It is easy to fabricate, it is nonmagnetic.

Beryllium copper tubing lends itself to a wide variety of applications. It can be severely worked to form convoluted flexible waveguides and bellows. Cold drawn to specifications, followed by proper hardening, it

makes an excellent aircraft antenna, with the strength to withstand thousands of hours' vibrating in 100 mph winds. Used as a contact roll in a business machine collator, it is wear and corrosion-resistant, and a good electrical conductor. Or, as above, shaped for use as a Bourdon tube, it is tough, ductile, durable—and holds its original shape.

Superior produces tubing in over 63 analyses... in stainless, alloy and carbon steels, nickel and nickel alloys, beryllium copper, titanium and zirconium. Let Superior's tubemanship and experience help you solve your tubing problems. You'll like the service and the products—they *are* habit-forming. Send for your free copy of Data Memorandum No. 7 on beryllium copper tubing. Write Superior Tube Company, 2004 Germantown Ave., Norristown, Pa.

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The Iron Age SUMMARY...

Industrial demand and Suez teaming up on steel producers . . . Outlook is for one of toughest first quarters in steel history . . . Scrap prices set a new record.

Tough Combination . . . Industrial demand and international unrest are closing in on the steel industry. At the same time, the mills are hard put to maintain production in the face of growing maintenance problems.

It looks as though domestic requirements and the impact of Suez on European steel supply will converge on steel producers in first quarter. This combination would make the first three months of 1957 one of the tightest in steel history.

While the situation is not serious, steel producers are running into recurring maintenance problems growing out of sustained high-level production. Mill breakdowns and other delays are cutting into output. Approaching holidays also will hurt production efficiency. This means that delivery carryovers into January will be that much heavier.

The Suez closing and oil pipeline damage will compound steel demand from Europe. Lack of oil in Great Britain and Europe generally is cutting down steel output and hampering production. This will be reflected in first quarter demand for export steel.

Auto Capers . . . Domestic demand will prevent U. S. producers from sending too much steel

abroad. But emergency needs plus an attempt to repair damaged relations with our allies mean that more steel will be earmarked for export.

The auto companies have been giving some producers a hard time. Delivery postponements have forced these mills to sell scattered tonnages to other users. These postponements were due partially to year-end inventory policy.

But the signs are unmistakable that Detroit is snapping out of its tight inventory policy. For instance, two automotive companies have asked one producer for more cold-rolled sheet in January. One automaker took 40 pct more than it had ordered originally. The second auto company was turned down.

The change-about by Detroit reflects pressure from dealers for more new cars. Early in the new model runs, production problems had handicapped output. Now these hurdles are just about overcome. The mills look for car manufacturers to revise their schedules upward.

Scrap Boom . . . Steel scrap prices rose sharply in some consuming areas. Strong demand coupled with exports and winter weather are bulling the market. Inventories of some mills have been far from comfortable.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,474	2,462	2,513	2,308
Ingot Index				
(1947-1949=100)	154.0	153.3	156.3	149.2
Operating Rates				
Chicago	100.0	100.0*	103.0	99.0
Pittsburgh	96.0	96.0	101.0	99.0
Philadelphia	104.0	105.0	107.5	105.0
Valley	98.0	100.0*	98.0	98.0
West	101.0	101.0	105.0	100.0
Detroit	107.0	104.0	106.0	97.0
Buffalo	105.0	105.0	105.0	105.0
Cleveland	102.0	103.5*	105.0	99.0
Birmingham	95.0	96.0	96.0	94.5
S. Ohio River	96.0	96.0	84.0	94.0
Upper Ohio R.	105.0	106.0*	105.0	105.0
St. Louis	102.0	100.0	105.0	101.0
Northeast	100.0	100.0	100.0	89.0
Aggregate	100.5	100.0	102.0	99.5

*Revised

Prices At A Glance

(cents per lb unless otherwise noted)

	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	5.622	5.622	5.622	5.174
Pig Iron (Gross Ton)	\$63.04	\$63.04	\$63.04	\$59.09
Scrap, No. 1 hvy (gross ton)	\$64.33	\$61.33	\$57.50	\$47.00
Nonferrous				
Aluminum ingot	27.10	27.10	27.10	24.40
Copper, electrolytic	40.00	40.00	40.00	43.00
Lead, St. Louis	15.80	15.80	15.80	15.30
Magnesium ingot	36.00	36.00	36.00	33.25
Nickel, electrolytic	64.50	64.50	64.50	64.50
Tin, Straits, N. Y.	111.50	112.75	108.25	99.125
Zinc, E. St. Louis	13.50	13.50	13.50	13.00

*Revised

Sheet Market Contradictory

Mills shooting for cold finished business, passing up hot-rolled orders . . . "Looseness" in cold-rolled supply not proved . . . Carmaker deferments benefit other buyers.

◆ THERE'S AN Alice-in-Wonderland contradiction in the sheet market these days. While the hot-rolled market is tight as a drum, producers are favoring production of cold-finished sheet. Yet, recurring reports of spot order postponements give the illusion of easiness in cold-rolled sheet.

Actually the cold finished market isn't loose. Tonnages passed up by one consumer find a home with another.

The oddity of the situation is pointed up in one market area where two mills have some cold-rolled sheet open in January. Another producer, however, will have a sizable carryover of hot-rolled orders going into the new year. Some mills are not producing hot-rolled sheet for sale.

A Pittsburgh area producer has been offering cold-rolled sheet in a Mid-Western market area at competitive prices. Yet, in that area, hot-rolled sheet is still a shortage item.

Heavy demand is forcing mills to shift more raw steel into plate, structurals, and oil country goods. In addition, a few are selling slabs for conversion to light plate.

Availability of spot tonnage of c-r sheet is benefiting the warehouses. Some are getting minor windfalls on cancelled sheets.

It looks as though by mid-December when the automotive buyers decide to take a plunge, supply will be thinner than at present.

Mills are running into annoying maintenance and repair problems. These delays reflect capacity operations over a prolonged period.

BARS . . . Deliveries at Cleveland continue to lengthen on h-r bars, pulling cold-finished along with them. Hot-rolled is booked solidly almost through the first quarter. There are,

however, embarrassing spot tonnages available due to auto deferments. Standard sizes of cold-finished bars are still generally available almost from stock.

Cold-finishers at Chicago continue to take December business. It's expected there'll be a business pickup in late January and February. Cold-finished bar producers seem shaken by the amount of bar that customers are pulling out of inventory. Automotive and warehouse sales are continuing off. However, with other strong buying November business will probably be a little higher than October's.

At Detroit auto industry's high inventories are probably back of slackness in sale of bars.

WIRE . . . Deliveries have dropped off noticeably in the last few weeks for manufacturers' wire. At Boston they slid from 4-6 weeks a month ago down to the 2-4 week period quoted at present.

In Chicago and Cleveland they are stronger at 5-7 weeks, only about a week less than mentioned a month ago. Much of the deferred auto tonnage is being taken up by fastener producers, upholstering and furniture makers, and spring wire makers. Merchant wire is in a seasonal lull with delivery from stock on standard items.

Imports continue making inroads, particularly in barbed wire and nails.

A Pittsburgh producer is booked solidly for December and January on manufacturers' wire. Same mill is taking orders for February and looks for a pickup in automotive demand to strengthen the wire market. Wire mesh and merchant wire products are slow.

WAREHOUSES . . . Demand has been lagging at Pittsburgh the past 10 days. Still tight, however, are wide flange beams, plates over ¾ in., heavy structural sections and bar angles. In easier demand and better supply are light plates, and smaller bars. However, mill allotments have not been increased, indicating no basic lag in these products.

Cleveland warehouses continue to live off the railroad car on tight items and are working to unload the loose ones. Plate and structurals are hardest to get. Following the end of production of light plate by one sheet mill in the area, the plate market is expected to snap back as tight as ever.

If the first two weeks of November are an indication, Chicago distributors report, business should be better than in October. There are spot inventory holes in hot-rolled bar in the ¾ in. diam categories. Cold-rolled sheet inventories continue to be classed as ample. Expected quota cuts from some mills on January and February hot-rolled bar are causing some worry.

TINPLATE . . . Pittsburgh mills are going through the seasonal inventory buildup in tinplate. While shipments are off, production goes on at a high level. The shortage of tin hasn't limited one mill's production as yet. Export orders are going begging because mills see domestic consumers taking all their output through the first half of next year at least.

PIPE AND TUBING . . . Oil country goods at Pittsburgh are sold out through the first quarter. Mechanical tubing is sold out through February.

IRON ORE . . . Race against the weatherman continues to bear fruit, Cleveland reports, as ore boats on the Lakes cut their deficit behind last year to 11.9 million tons. U. S. and Canadian ports received 1.84 million tons for last week compared to 1.73 in 1955. Their total to November 19 was 73.3 million tons. Last year at the same time it was 85.2 million tons.

Purchasing Agent's Checklist

SPECIAL REPORT: Are warehouses steel's No. 1 customer? . . . p. 35

MARKETING: New markets give fresh strength to high-strength sales . . . p. 37

CONSTRUCTION: Use of metal curtain walls is growing . . . p. 40

MARKETING: Power demand boosts engine sales . . . p. 44

Comparison of Prices

(Effective Nov. 27, 1956)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

	Nov. 27 1956	Nov. 20 1956	Oct. 30 1956	Nov. 30 1955
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	4.675¢	4.675¢	4.675¢	4.325¢
Cold-rolled sheets	5.75	5.75	5.75	5.325
Galvanized sheets (10 ga.)	6.30	6.30	6.30	5.85
Hot-rolled strip	4.675	4.675	4.675	4.325
Cold-rolled strip	6.870	6.870	6.870	6.29
Plate	4.87	4.87	4.87	4.52
Plates, wrought iron	10.40	10.40	10.40	9.30
Stainl's C-R strip (No. 302)	47.50	47.50	47.50	44.50
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	\$9.95	\$9.95	\$9.85	\$9.05
Tinplates, electro (0.50 lb.)	8.65	8.65	8.55	7.75
Special coated mfg. ternes	9.20	9.20	9.10	7.85
Bars and Shapes: (per pound)				
Merchant bars	5.075¢	5.075¢	5.075¢	4.65¢
Cold finished bars	6.85	6.85	6.85	5.90
Alloy bars	6.125	6.125	6.125	5.65
Structural shapes	5.00	5.00	5.00	4.60
Stainless bars (No. 302)	40.75	40.75	40.75	38.25
Wrought iron bars	11.50	11.50	11.50	10.40
Wire: (per pound)				
Bright wire	7.20¢	7.20¢	7.20¢	6.25¢
Rails: (per 100 lb.)				
Heavy rails	\$5.075	\$5.075	\$5.075	\$4.725
Light rails	6.00	6.00	6.00	5.65
Semifinish Steel: (per net ton)				
Rerolling billets	\$74.00	\$74.00	\$74.00	\$68.50
Slabs, rerolling	74.00	74.00	74.00	68.50
Forging billets	91.50	91.50	91.50	84.50
Alloy blooms, billets, slabs	107.00	107.00	107.00	96.00
Wire Rod and Skelp: (per pound)				
Wire rods	5.80¢	5.80¢	5.80¢	5.025¢
Skelp	4.225	4.225	4.225	4.225
Finished Steel Composite: (per pound)				
Base price	5.622¢	5.622¢	5.622¢	5.174¢

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

	Nov. 27 1956	Nov. 20 1956	Oct. 30 1956	Nov. 30 1955
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	\$67.76	\$67.76	\$67.76	\$63.69
Foundry, Valley	63.00	63.00	63.00	59.00
Foundry, Southern Cin'ti	67.17	67.17	67.17	62.93
Foundry, Birmingham	59.00	59.00	59.00	55.00
Foundry, Chicago	63.00	63.00	63.00	59.00
Basic del'd Philadelphia	66.84	66.84	66.84	62.77
Basic Valley furnace	62.50	62.50	62.50	58.50
Malleable, Chicago	63.00	63.00	63.00	59.00
Malleable, Valley	63.00	63.00	63.00	59.00
Ferromanganese, cents per lb.	11.75¢	11.75¢	11.75¢	9.50¢
74 to 76 pct Mn base.				
Pig Iron Composite: (per gross ton)				
Pig iron	\$63.04	\$63.04	\$63.04	\$59.09
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	\$66.50	\$62.50	\$57.50	\$48.00
No. 1 steel, Phila. area	62.50	58.50	57.50	48.50
No. 1 steel, Chicago	64.00	63.00	57.50	44.50
No. 1 bundles, Detroit	60.50	60.50	56.50	42.00
Low phos., Youngstown	69.50	68.50	65.50	49.50
No. 1 mach'y cast, Pittsburgh	61.50	61.50	59.50	52.50
No. 1 mach'y cast, Philadelphia	58.50	58.00	58.00	53.50
No. 1 mach'y cast, Chicago	58.50	58.50	56.50	54.50
Steel Scrap Composite: (per gross ton)				
No. 1 heavy melting scrap	\$64.33	\$61.33	\$57.50	\$47.00
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	\$15.50	\$15.50	\$14.50	\$14.25
Foundry coke, prompt	\$18.19	\$18.19	\$17.18	\$16.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	40.00	40.00	40.00	45.00
Copper, Lake, Conn.	40.00	40.00	40.00	43.00
Tin, Straits, New York	111.50¢	112.75	108.25	99.125
Zinc, East St. Louis	13.50	13.50	13.50	13.00
Lead, St. Louis	15.80	15.80	15.80	15.30
Aluminum, virgin ingot	27.10	27.10	27.10	24.40
Nickel, electrolytic	64.50	64.50	64.50	64.50
Magnesium, ingot	36.00	36.00	36.00	33.25
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

† Tentative. ‡ Average. * Revised.

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

STAINLESS STEEL

←To identify producers, see Key on P. 130→

Base price cents per lb. f.o.b. mill.

Producing Point	Basic	Fdry.	Mall.	Beas.	Low Phos.
Bethlehem B3	64.50	65.00	65.50	66.00	
Birdsboro, Pa. B6	64.50	65.00	65.50	66.00	
Birmingham R3	58.50	59.00*	59.50	60.00	
Birmingham H9	58.50	59.00*	59.50	60.00	
Birmingham U4	58.50	59.00*	59.50	60.00	
Buffalo R3	62.50	63.00	63.50	64.00	
Buffalo H1	62.50	63.00	63.50	64.00	
Buffalo H6	62.50	63.00	63.50	64.00	
Chester P2	64.50	65.00	65.50	66.00	
Chicago J4	62.50	63.00	63.50	64.00	
Cleveland A5	62.50	63.00	63.50	64.00	67.50†
Cleveland R3	62.50	63.00	63.50	64.00	
Duluth J4	62.50	63.00	63.50	64.00	67.50†
Erie J4	62.50	63.00	63.50	64.00	67.50†
Everett M6	62.50	63.00	63.50	64.00	
Fontana K1	70.00	70.50	71.00	71.50	
Geneva, Utah C7	62.50	63.00	63.50	64.00	
Granite City C7	64.40	64.90	65.40	65.90	
Hubbard V1	62.50	63.00	63.50	64.00	
Lane Star L3	58.50†	59.00†	59.50	60.00	
Midland C11	62.50	63.00	63.50	64.00	
Minnequa C6	64.50	65.00	65.50	66.00	
Monessen P6	62.50	63.00	63.50	64.00	
Neville Is. P4	62.50	63.00	63.50	64.00	67.50†
N. Tonawanda T1	62.50	63.00	63.50	64.00	
Pittsburgh U1	62.50	63.00	63.50	64.00	
Sharpville S3	62.50	63.00	63.50	64.00	
Sr. Chicago R3	62.50	63.00	63.50	64.00	
Steelton B3	64.50	65.00	65.50	66.00	70.50
Swedeland A2	64.50	65.00	65.50	66.00	
Teledo J4	62.50	63.00	63.50	64.00	
Troy, N. Y. R3	64.50	65.00	65.50	66.00	
Youngstown V1	62.50	63.00	63.50	64.00	

DIFFERENTIALS: Add, 50¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.50 pct manganese or portion thereof over 1 pct, 52¢ per ton for 0.5 to 0.75 pct nickel, \$1 for each additional 0.25 pct nickel. * Add \$1.00 for 0.31-0.40 pct phos. † Intermediate low phos. ‡ Add \$1.00 for 0.31 to 0.50 pct phos.
Silvery iron: Buffalo, H1, \$72.50; Jackson, J1, 14 (Globe Div.), \$71.50; Niagara Falls (15.01-15.50), \$99.50; Kookuk (14.01-14.50), \$102.00; (15.51-16.00), \$105.00. \$1.25 per ton for each 0.50 pct silicon over base (\$0.1 to \$5.0) up to 14 pct. Add 75¢ for each 0.50 pct manganese over 1.0 pct. Bessemer ferroalloys: \$44.00.

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingot, reroll.	19.75	21.00	20.50	22.00	—	23.25	35.25	28.25	32.75	—	16.00	27.75	16.25
Slabs, billets	24.50	27.25	25.25	28.00	28.50	29.25	44.50	35.75	42.00	—	28.75	—	21.00
Billets, forging	—	33.00	33.75	34.00	37.00	36.00	56.25	42.25	50.25	38.75	27.25	27.75	27.75
Bars, struct.	39.00	39.25	40.50	40.75	43.75	43.00	66.75	50.25	59.00	36.25	32.50	33.00	33.00
Plates	—	41.25	42.50	43.00	45.50	45.75	70.25	54.50	63.75	38.75	33.75	35.50	34.50
Sheets	45.00	45.25	47.25	47.50	55.75	50.25	74.75	60.00	73.00	46.50	38.75	46.50	39.25
Strip, hot-rolled	33.00	35.75	34.00	36.75	—	39.75	63.50	48.75	58.25	—	29.75	—	39.75
Strip, cold-rolled	41.50	45.25	43.75	47.50	52.00	50.25	74.75	60.00	73.00	46.50	38.75	46.50	39.25
Wire CF; Rod HR	—	37.25	38.35	38.75	41.50	40.75	63.50	48.00	56.25	34.50	31.00	31.50	31.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J3; Baltimore, Md.; Middletown, O., A7; Massillon, O., R3; Gary, Ind., U1; Bridgeville, Pa., U2; New Castle, Ind., I2; Ft. Wayne, Ind., J4; Philadelphia, D5.

Strip: Midland, Pa., C11; Waukegan, Cleveland, A5; Carnegie, Pa., S9; McKeesport, Pa., F1; Reading, Pa., C2; Washington, Pa., W2; W. Lechburg, Pa., A3; Bridgeville, Pa., U2; Detroit, Md.; Canton-Massillon, O., R3; Harrison, N. J., D3; Youngstown, C5; Sharon, Pa., S1; Butler, Pa., A7; Wallingford, Conn., U3 (plus further conversion extras); W1 (.25 per lb. higher); New Bedford, Mass., R6; Gary, Ind. (.25¢ per lb. higher).

Bar: Baltimore, A7; S. Duquesne, Pa., U1; Munhall, Pa., U1; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., U1, F1; Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R3; S. Chicago, U1; Syracuse, N. Y., C11; Watervliet, N. Y., A3; Waukegan, A3; Canton, O., T3; Ft. Wayne, I4; Philadelphia, D5; Detroit, R5; Gary, U1.

Wire: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Brackenridge, Pa., A3; Chicago, U1; Munhall, Pa., U1; Midland, Pa., C11; New Castle, Ind., I2; Middletown, A7; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., C15; Philadelphia, D5; Vandergrift, Pa., U1; Gary, U1.

Forgings: Billets: Midland, Pa., C11; Baltimore, A7; Washington, Pa., J2; McKeesport, F1; Massillon, Canton, O., R3; Watervliet, A3; Pittsburgh, Chicago, U1; Syracuse, C11; Detroit, R5; Munhall, Pa., S. Chicago, U1.

Price Resistance Folds

New purchases send prices up \$4 in some market areas . . . Short dock strike failed to weaken the record high market . . . Bad weather hits collections.

♦ ALL RESISTANCE to higher prices broke as a major consumer entered the market at new, higher prices for No. 1 and No. 2 grades.

Initiative was taken in Pittsburgh, where steelmaking grades jumped \$4 with the new purchases. Effects spread to other districts where, in most cases, broker buying prices had already jumped far out ahead of official mill quotations.

The new scrap price level, which places scrap higher than pig iron in price, placed THE IRON AGE Composite price at \$64.33, another new high. It continued the recent upsurge that establishes each new price increase as a new all-time record.

Mills are frankly worried about a severe scrap shortage. The short dock strike had no weakening effect on the market, although it did postpone the inevitable entry into the market at the new prices.

Aggravating the situation is the heavy snow and severe winter weather. Heavy snow in the Great Lakes areas hampered collections by dealers who already were unable to maintain adequate supplies.

The one cheerful note supplywise is that auto production is approaching full speed, and auto scrap generation at a high level. But even this is not expected to ease demand.

Blast furnace grades are also up in many markets. Blast furnaces are pressed to the limit, with a resulting demand for turnings.

As might be expected, electric furnace grades are bringing premium prices.

Pittsburgh . . . Prices of No. 1 and No. 2 grades jumped a full \$4 as a major consumer entered the market. Higher prices indicated that a severe scrap shortage may be in prospect. Good scrap is very scarce and bad weather is aggravating the serious

situation. The dock strike also failed to weaken the market. Turnings are also strong as mills push blast furnaces to the limit.

Chicago . . . Stubborn mill resistance to high prices failed to break the price front. Stronger prices in the East had the effect of reinforcing strong local broker buying prices or even increasing them. Reported new sales of No. 1 industrial heavy melting at relatively low figures failed to dim general opinion that new factory lists would bring \$3 to \$5 price advances. Shipments of scrap from the district continue in heavy quantity. Buyers are expecting a very hard winter, scrapwise. Dealer inventories are low, at a period when collections are difficult.

Philadelphia . . . Prices of steelmaking grades climbed on the basis of new purchases. The market is extremely tight, with inventories low and not too much scrap available. The dock strike failed to depress the market.

New York . . . New domestic orders and exports pushed steelmaking grades up \$2 per ton this week. No. 1 heavy melting steel moved to \$56, top. All cast grades except chemical borings rose \$1 per ton. Added strength was seen in indications that heavy new buying by the mills is in the offing.

Detroit . . . December lists began closing this week and indications are that prices will be just as high and possibly higher than they were last month. The continued high steel operating rate plus the onset of winter weather are the main reasons for the bullish tone of the market. Amount of scrap generated here continues to increase as automakers are coming closer to peak production.

Cleveland . . . No. 2 heavy melting jumped \$5 in the Valley on the basis

of a moderate tonnage purchased at \$58. This reduced the spread with primary grades to a more reasonable level and indicated tightness in supply. Other brokers are meeting the price to cover older orders, some as low as \$50. No. 2 bundles and low phos rose in sympathy. Big question is what local and Michigan factory bundles will bring this week. Some foundry prices are off.

Birmingham . . . No one is in the market at present for No. 1 steel. But electric furnace grades are still strong and prices remain steady. Consumers are able to fill their needs from local scrap producers. Some specialty scrap continues to move north. The cast market is steady, with a steadily dwindling supply of pig iron because of a strike at one of the district's commercial producers. Export is not affected by the dock strike, and exporters are paying higher prices for No. 1 steel.

St. Louis . . . The market is generally higher with advances ranging from \$1 to \$3. The market continues strong with a heavy demand and continued high mill operating rate. Snow in the area is expected to further slow down collections. Railroad lists brought higher prices.

Cincinnati . . . The market continues with underlying strength. Prices for next month are fully expected to equal or exceed November's. Collections are slow and yards are not full. Some activity exists in rails for foundries, with part of the increase due to continued competition with re-rolling mills.

Buffalo . . . Heavy snowfall in this area has slowed deliveries of scrap to a near halt. This has further strengthened the market. Prices remain firm, but with no new sales. Slight increases may be ahead with new monthly orders.

Boston . . . Prices remain firm on the basis of an active domestic market. The dock strike did not affect the market to a great extent, with the exception of slowing unstripped motor blocks.

West Coast . . . In contrast to other areas, mills here claim they could get more scrap if they wanted to do any inventory building. They are buying only for current needs. Export to Japan continues brisk. Cast is weak. Price drops are forecast.

Scrap Prices (Effective Nov. 27, 1956)

Pittsburgh

No. 1 hvy melting	\$66.00 to \$67.00
No. 2 hvy melting	58.00 to 59.00
No. 1 bundles	66.00 to 67.00
No. 1 factory bundles	75.00 to 76.00
No. 2 bundles	53.00 to 54.00
Machine shop turn.	41.00 to 42.00
Mixed bor. and ms. turn.	41.00 to 42.00
Shoveling turnings	46.00 to 47.00
Cast iron borings	46.00 to 47.00
Low phos. punch'gs plate	73.00 to 74.00
Heavy turnings	59.00 to 60.00
No. 1 RR. hvy. melting	70.00 to 71.00
Scrap rails, random lgth.	78.00 to 79.00
Rails 2 ft and under	82.00 to 83.00
RR. steel wheels	75.00 to 76.00
RR. spring steel	75.00 to 76.00
RR. couplers and knuckles	75.00 to 76.00
No. 1 machinery cast.	61.00 to 62.00
Cupola cast.	54.00 to 55.00
Heavy breakable cast.	52.00 to 53.00

Chicago

No. 1 hvy. melting	\$63.00 to \$65.00
No. 2 hvy. melting	54.00 to 55.00
No. 1 factory bundles	71.00 to 72.00
No. 1 dealers' bundles	64.00 to 65.00
No. 2 dealers' bundles	48.00 to 49.00
Machine shop turn.	41.00 to 42.00
Mixed bor. and turn.	43.00 to 44.00
Shoveling turnings	44.00 to 45.00
Cast iron borings	43.00 to 44.00
Low phos. forge crops	74.00 to 75.00
Low phos. punch'gs plate	71.00 to 72.00
Low phos. 2 ft and under	69.00 to 70.00
No. 1 RR. hvy. melting	70.00 to 71.00
Scrap rails, random lgth.	80.00 to 81.00
Rerolling rails	81.00 to 82.00
Rails 2 ft and under	88.00 to 89.00
Locomotive tires, cut	74.00 to 75.00
Cut bolsters & side frames	74.00 to 75.00
Angles and splice bars	79.00 to 80.00
RR. steel car axles	83.00 to 84.00
RR. couplers and knuckles	73.00 to 74.00
No. 1 machinery cast.	58.00 to 59.00
Cupola cast.	53.00 to 54.00
Heavy breakable cast.	48.00 to 50.00
Cast iron brake shoe	50.00 to 51.00
Cast iron wheels	58.00 to 60.00
Malleable	73.00 to 74.00
Stove plate	50.00 to 51.00
Steel car wheels	74.00 to 75.00

Philadelphia Area

No. 1 hvy. melting	\$62.00 to \$63.00
No. 2 hvy. melting	55.00 to 56.00
No. 1 bundles	62.00 to 63.00
No. 2 bundles	53.00 to 54.00
Machine shop turn.	41.00 to 42.00
Mixed bor. short turn.	40.00 to 41.00
Cast iron borings	40.00 to 41.00
Shoveling turnings	45.00 to 46.00
Clean cast chem. borings	48.00 to 49.00
Low phos. 5 ft and under	65.00 to 66.00
Low phos. 2 ft and under	67.00 to 68.00
Low phos. punch'gs	67.00 to 68.00
Elec. furnace bundles	62.00 to 63.00
Heavy turnings	55.00 to 56.00
RR. steel wheels	71.00 to 72.00
RR. spring steel	71.00 to 72.00
Rails 18 in. and under	80.00 to 82.00
Cupola cast.	52.00 to 54.00
Heavy breakable cast.	56.00 to 57.00
Cast iron car wheels	64.00 to 65.00
Malleable	68.00 to 69.00
Unstripped motor blocks	44.00 to 45.00
No. 1 machinery cast.	58.00 to 59.00

Cleveland

No. 1 hvy. melting	\$64.50 to \$65.50
No. 2 hvy. melting	48.00 to 49.00
No. 1 bundles	64.50 to 65.50
No. 1 factory bundles	71.00 to 72.00
No. 2 bundles	43.00 to 44.00
No. 1 busheling	64.50 to 65.50
Machine shop turn.	34.00 to 35.00
Mixed bor. and turn.	38.00 to 39.00
Shoveling turnings	38.00 to 39.00
Cast iron borings	38.00 to 39.00
Cut struct'l & plates, 2 ft & under	67.00 to 68.00
Drop forge flashings	65.50 to 66.50
Low phos. punch'gs, plate	65.50 to 66.50
Foundry steel, 2 ft & under	62.00 to 63.00
No. 1 RR. heavy melting	70.00 to 71.00
Rails 2 ft and under	83.00 to 84.00
Rails 18 in. and under	84.00 to 85.00
Railroad grate bars	49.00 to 50.00
Steel axle turnings	44.00 to 45.00
Railroad cast.	61.00 to 62.00
No. 1 machinery cast.	56.50 to 57.50
Stove plate	53.00 to 54.00
Malleable	71.00 to 72.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Youngstown

No. 1 hvy. melting	\$66.50 to \$67.50
No. 2 hvy. melting	57.00 to 58.00
No. 1 bundles	66.50 to 67.50
No. 2 bundles	48.00 to 49.00
Machine shop turn.	34.00 to 35.00
Shoveling turnings	40.00 to 41.00
Cast iron borings	40.00 to 41.00
Low phos. plate	69.00 to 70.00

Buffalo

No. 1 hvy. melting	\$56.00 to \$57.00
No. 2 hvy. melting	46.00 to 47.00
No. 1 busheling	56.00 to 57.00
No. 1 bundles	56.00 to 57.00
No. 2 bundles	43.00 to 44.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	34.00 to 35.00
Cast iron borings	32.00 to 33.00
Low phos. plate	61.00 to 62.00
Scrap rails, random lgth.	57.00 to 58.00
Rails 2 ft and under	77.00 to 78.00
RR. steel wheels	60.00 to 61.00
RR. spring steel	60.00 to 61.00
RR. couplers and knuckles	70.00 to 71.00
No. 1 machinery cast.	52.00 to 53.00
No. 1 cupola cast.	48.00 to 49.00

Detroit

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$59.00 to \$60.00
No. 2 hvy. melting	50.00 to 51.00
No. 1 bundles, openhearth	60.00 to 61.00
No. 2 bundles	44.00 to 45.00
New busheling	59.00 to 60.00
Drop forge flashings	58.50 to 59.50
Machine shop turn.	29.00 to 30.00
Mixed bor. and turn.	32.00 to 33.00
Shoveling turnings	32.00 to 33.00
Cast iron borings	32.00 to 33.00
Low phos. punch'gs, plate	59.00 to 60.00
No. 1 cupola cast.	51.00 to 52.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	45.00 to 46.00
Automotive cast.	54.00 to 55.00

St. Louis

No. 1 hvy. melting	\$55.00 to \$56.00
No. 2 hvy. melting	48.00 to 49.00
No. 1 bundles	58.00 to 59.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	39.00 to 40.00
Cast iron borings	41.00 to 42.00
Shoveling turnings	41.00 to 42.00
No. 1 RR. hvy. melting	66.00 to 67.00
Rails, random lengths	82.00 to 83.00
Rails 18 in. and under	86.00 to 87.00
Locomotive tires uncut	68.00 to 69.00
Angles and splice bars	70.00 to 71.00
Std. steel car axles	84.00 to 85.00
RR. specialties	71.50 to 72.50
Cupola cast.	51.00
Heavy breakable cast.	46.50 to 47.50
Cast iron brake shoes	54.00 to 55.00
Stove plate	44.00 to 45.00
Cast iron car wheels	56.00 to 57.00
Rerolling rails	88.00 to 89.00
Unstripped motor blocks	43.00 to 44.00

Boston

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$52.00 to \$53.00
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	52.00 to 53.00
No. 2 bundles	37.50 to 38.50
No. 1 busheling	52.00 to 53.00
Elec. furnace, 3 ft & under	55.00 to 56.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and short turn.	32.00 to 33.00
Shoveling turnings	34.00 to 35.00
Clean cast chem. borings	35.00 to 36.00
No. 1 machinery cast.	46.00 to 47.00
Mixed cupola cast.	42.00 to 43.00
Heavy breakable cast.	44.00 to 45.00
Stove plate	40.00 to 41.00
Unstripped motor blocks	32.00 to 33.00

New York

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$55.00 to \$56.00
No. 2 hvy. melting	46.00 to 47.00
No. 2 bundles	44.00 to 45.00
Machine shop turn.	33.50 to 34.50
Mixed bor. and turn.	33.50 to 34.50
Shoveling turnings	39.00 to 40.00
Clean cast chem. borings	35.00 to 36.00
No. 1 machinery cast.	52.00 to 53.00
Mixed yard cast.	47.00 to 48.00
Charging box cast.	48.00 to 49.00
Heavy breakable cast.	48.00 to 49.00
Unstripped motor blocks	38.00 to 39.00

Birmingham

No. 1 hvy. melting	\$46.00 to \$47.00
No. 2 hvy. melting	44.00 to 45.00
No. 1 bundles	46.00 to 47.00
No. 2 bundles	38.00 to 39.00
No. 1 busheling	46.00 to 47.00
Machine shop turn.	36.00 to 37.00
Shoveling turnings	37.00 to 38.00
Cast iron borings	27.00 to 28.00
Electric furnace bundles	54.00 to 55.00
Bar crops and plate	60.00 to 61.00
Structural and plate, 2 ft.	59.00 to 60.00
No. 1 RR. hvy. melting	61.00 to 62.00
Scrap rails, random lgth.	69.00 to 70.00
Rails, 18 in. and under	74.00 to 75.00
Angles & splice bars	66.00 to 67.00
Rerolling rails	80.00 to 81.00
No. 1 cupola cast.	52.00 to 53.00
Stove plate	51.00 to 52.00
Charging box cast.	40.00 to 41.00
Cast iron car wheels	45.00 to 46.00
Unstripped motor blocks	44.00 to 45.00
Mashed tin cans	15.00 to 16.00
Elec. furnace, 3 ft & under	52.00 to 53.00

Cincinnati

Brokers buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$59.00 to \$60.00
No. 2 hvy. melting	49.00 to 50.00
No. 1 bundles	59.00 to 60.00
No. 2 bundles	42.00 to 44.00
Machine shop turn.	39.00 to 40.00
Mixed bor. and turn.	39.50 to 40.50
Shoveling turnings	42.00 to 43.00
Cast iron borings	39.50 to 40.50
Low phos. 18 in. & under	66.00 to 67.00
Rails, random lengths	74.00 to 75.00
Rails, 18 in. and under	82.00 to 83.00
No. 1 cupola cast.	48.00 to 49.00
Hvy. breakable cast.	47.00 to 48.00
Drop broken cast.	59.00 to 60.00

San Francisco

No. 1 hvy. melting	\$54.00
No. 2 hvy. melting	52.00
No. 1 bundles	52.00
No. 2 bundles	43.00
Machine shop turn.	35.00
Cast iron borings	35.00
No. 1 RR. hvy. melting	55.00
No. 1 cupola cast.	60.00

Los Angeles

No. 1 hvy. melting	\$54.00
No. 2 hvy. melting	52.00
No. 1 bundles	53.00
No. 2 bundles	40.00
Machine shop turn.	35.00
Cast iron borings	35.00
No. 1 RR. hvy. melting	55.00
No. 1 cupola cast.	60.00

Seattle

No. 1 hvy. melting	\$54.00
No. 2 hvy. melting	51.00
No. 2 bundles	35.00
No. 1 cupola cast.	55.00
Mixed yard cast.	55.00

Hamilton, Ont.

No. 1 hvy. melting	\$52.00
No. 2 hvy. melting	47.00
No. 1 bundles	52.00
No. 2 bundles	40.50
Mixed steel scrap	46.00
Bushelings	39.50
Bush., new fact., prep'd.	50.00
Bush., new fact., unprep'd	45.00
Machine shop turn.	31.00
Short steel turn.	35.00
Mixed bor. and turn.	28.00
Rails, rerolling	60.00
Cast scrap	50.00

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November 29, 1956

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Aluminum Buyers Form Agency

Purchasing group, called Aluminum Procurement Corp., will be set up by independent processors, fabricators . . . They are preparing for slash in allotments in '57.

♦ THE ALUMINUM supply situation in 1956 is better than it has been for a number of years.

But not all pig, ingot and billet consumers are confident this situation will continue through 1957. Consequently, a number of independent processors and fabricators are setting up a purchasing agency. Its aim: to provide collective purchasing power greater than the sum of its members individually.

The group, called Aluminum Procurement Corp., is worried particularly about the last half of 1957. At this time government contracts with Aluminum Co. of America, Reynolds Metals, and Kaiser Aluminum will expire. These agreements, made to spur expansion during the Korean conflict, provide 2% of the output from expanded facilities be channeled to independent processors. Aluminum Procurement Corp. says it expects independents' share of expanded production to be cut in last half of '57.

ALPRO expects to offset this by offering the producers firm, long-term contracts totaling 100 to 200 million lb annually.

The new corporation is applying to the Small Business Administration for support. It wants \$5 million. This fund would be used by SBA to buy metal which a member contracts for and fails to take. The aluminum could be redeemed by the member repaying SBA. According to the ALPRO plan, if the fund should show signs of becoming exhausted SBA could then offer metal to Office of Defense Mobilization for the national stockpile.

SBA has gone on record in favor of such pooling arrangements. But whether it will back ALPRO with hard cash is still an open question.

ALPRO expects to begin operations with 25 members. It claims a potential of 225, but does not in-

tend to get that big. Maximum goal is 100.

Participating membership costs an independent processor \$1500, for which he gets one share or vote. No company may have more. An individual company will then be eligible to contract through ALPRO for a maximum of 30 pct of its requirements. A surcharge of 1/2 mill per lb will be made for ALPRO's operating and administrative expenses. The actual contract will be directly between producer and consumer. ALPRO will assume no risks.

The purchasing group hopes to be able to maintain a reserve stock of metal up to 15 pct of its yearly contracts. This would be available to non-members who get caught in a supply fix.

Plans also call for a "watchdog" distribution committee to see that no undue advantage is taken by a member.

It appears that the big "if" is the

Primary Prices

cents per lb)	current price	last price	date of change
Aluminum ingot	27.18	25.90	8/10/56
Aluminum pig	25.00	24.00	8/10/56
Copper (E)	38.00	40.00	10/26/56
Copper (CS)	36.00	35.00	10/31/56
Copper (L)	36.00	40.00	10/27/56
Lead, E. St. L.	18.80	16.30	1/12/56
Lead, N. Y.	16.00	16.50	1/12/56
Magnesium ingot	36.00	34.50	8/12/56
Magnesium pig	35.25	33.75	8/12/56
Nickel	64.50	60.00	11/24/54
Titanium sponge	270-300	295-325	7/7/56
Zinc, E. St. L.	13.50	13.00	1/6/56
Zinc, N. Y.	14.00	13.50	1/6/56

ALUMINUM: 99% ingot frt allwd. **COPPER:** (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. **LEAD:** common grade. **MAGNESIUM:** 99.8% pig. Velasco, Tex. **NICKEL:** Port Colbourne, Canada. **ZINC:** prime western. **TIN:** see column at right, other primary prices, pg. 126.

support of the Small Business Administration. The producers have acknowledged their willingness to talk after all arrangements have been made. It seems likely that they want the guarantee of the SBA before committing themselves.

Meanwhile, the Office of Defense Mobilization is closing five more aluminum processing expansion goals, shutting off further tax amortization for the product involved.

Production capacity for the five products is now "sufficient to meet all known requirements," says ODM.

Involved are facilities to produce welded tubing, forgings, heavy aircraft forgings, tapered sheet, and sheet and plate producing and heat treating facilities.

ALUMINUM . . . Recent report from the Dominion Bureau of Statistics, Canada, indicates a shift of markets for Canadian aluminum in favor of the U. S. During the first 9 months of 1956, 304,606,000 lbs of Canadian aluminum in bars, blocks, ingots and blooms came across the border. At that rate over 400 million lbs will be exported to the U. S. in 1956. This not only tops the previous year but reverses a trend. Less Canadian aluminum was imported in 1955 than 1954 despite the tight supply situation.

The U. S.'s biggest competitor for Canadian aluminum is the United Kingdom. Nine-month shipments of 317 million lbs tops the U. S. figure. But the trend here is down. At present rate the yearly total will be less than 1955.

MAGNESIUM . . . The Magnesium Assn. reports shipments for September, the third quarter, and the year thus far, are all up.

The 1540 tons shipped during September 1956 topped both the previous month, 1525 tons, and the corresponding month 1955, 1239 tons.

Shipments for the third quarter 1956 were up to 4470 tons from 3287 tons shipped in that quarter 1955.

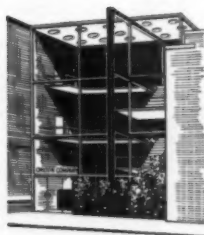
The 13,519 tons shipped during the first three quarters is well in excess of the 10,503 tons shipped during the same period in 1955.

Tin prices for the week: Nov. 21—112.25; Nov. 22—holiday; Nov. 23—112.00; Nov. 26—111.50; Nov. 27—111.50.*

* Estimate.

Concentration

One of the fine things about advertising is that you can always make your greatest effort where it will do you the most good. For example, when you advertise in business publications, you address a tremendous concentration of regular and avid readers—an intense audience just as interested in the advertising page as in the editorial page. And you will find, even if you never heard of the publication yourself, that a whale of a lot of important people in its field wouldn't miss an issue.



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Nonferrous Prices (Effective Nov. 27, 1956)

MILL PRODUCTS

(Cents per lb, unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed)

Flat Sheet (Mill Finish) and Plate

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3.
1800, 1100, 3003.....	44.3	42.1	40.9	40.2
5052.....	51.8	46.8	45.1	42.9
5061-0.....	48.9	44.6	42.8	42.6

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8.....	45.5-47.3	61.3-65.1
12-14.....	46.2-47.7	62.2-66.8
24-26.....	49.4-49.5	73.1-77.8
36-38.....	58.3-59.9	97.4-101.9

Screw Machine Stock—2011-T-3

Size*	3/4	5/8-3/4	3/4-1	1 1/4-1 3/4
Price	59.7	58.8	57.4	55.2

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length*→	72	96	120	144
.019 gage.....	\$1.352	\$1.803	\$2.254	\$2.704
.024 gage.....	1.686	2.252	2.815	3.378

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→	Gage→	.250-3.00	.250-2.00	.188	.081	.032
AZ31B Stand, Grade		67.9	69.0	77.9	103.1	
AZ31B Spec.		93.3	95.7	106.7	171.3	
Tread Plate		70.6	71.7			
Teeing Plate		73.0				

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	69.0	70.7	75.6	80.2
Spec. Grade (AZ31B)	94.6	95.7	90.6	104.3

Alloy Ingot

AZ91B (Die Casting)..... 37.25 (delivered)
AZ92A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices, f.o.b. mill)

"A" Nickel Monel

	Nickel	Inconel
Sheet, CR.....	113	118
Strip, CR.....	111	125
Rod, bar, HR.....	94	99
Angles, HR.....	94	99
Plates, HR.....	107	111
Seamless tube.....	144	190
Shot, blocks.....	78	...

COPPER, BRASS, BRONZE

(Freight included on 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	57.63	.....	54.86	57.62
Brass, 70/30	49.44	49.98	49.37	52.35
Brass, Low	52.65	53.19	52.59	55.46
Brass, R L	53.79	54.33	53.73	56.60
Brass, Naval	53.39	.....	47.70	56.55
Muntz Metal	51.44	.....	47.25	.....
Comm. Br.	55.48	56.02	55.42	58.04
Mang. Br.	57.13	.....	51.23	.....
Phos. Br. 5%	76.25	.....	76.75	.....

TITANIUM

(10,000 lb base, f.o.b. mill)

Sheet and strip, commercially pure, \$12.10-\$12.60; alloy, \$15.00-\$15.75; Plate, HR, commercially pure, \$10.00-\$10.50; alloy, \$11.50-\$12.00. Wire, rolled and/or drawn, commercially pure, 9.00-\$11.50; alloy, \$11.50; Bar, HR or forged, commercially pure, \$7.55-\$7.80; alloy, \$7.55-\$7.75.

PRIMARY METAL

(Cents per lb, unless otherwise noted)

Antimony, American, Laredo, Tex., \$3.50
Beryllium aluminum 5% Be, Dollar
per lb contained Be.....\$74.75
Beryllium copper, per lb conta'd Be.\$43.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading.....\$71.50
Bismuth, ton lots.....\$ 2.25
Cadmium, del'd.....\$ 1.70
Calcium, small lots.....\$ 4.55
Chromium, 99.9% metallic basis.....\$ 1.31
Cobalt, 97-99% (per lb).....\$2.60 to \$2.67
Germanium, per gm, f.o.b. Miami,
Okla., refined.....\$48.50
Gold, U. S. Treas., per troy oz.....\$35.00
Indium, 99.9% dollars per troy oz.....\$ 3.25
Iridium, dollars per troy oz.....\$90 to \$100
Lithium, 98%.....\$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb.....\$ 59.00
Mercury, dollars per 76-lb flask,
f.o.b. New York.....\$255 to \$257
Nickel oxide sinter at Copper
Chff. Ont., contained nickel.....\$ 60.75
Palladium, dollars per troy oz.....\$23 to \$24
Platinum, dollars per troy oz.....\$103 to \$105
Rhodium.....\$120.00 to \$125.00
Silver ingots (\$ per troy oz.).....\$1.875
Thorium, per kg.....\$43.00
Uranium, normal per kg.....\$40.00
Vanadium.....\$ 3.45
Zirconium sponge.....\$10.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
No. 115.....\$35.00
No. 120.....\$33.75
No. 123.....\$32.25
80-10-10 ingot
No. 305.....\$38.50
No. 315.....\$36.75
88-10-2 ingot
No. 210.....\$48.75
No. 215.....\$44.50
No. 245.....\$40.00
Yellow ingot
No. 405.....\$27.50
Manganese bronze
No. 421.....\$30.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
0.30 copper max.....\$26.25-\$26.75
0.60 copper max.....\$26.00-\$26.50
Piston alloys (No. 123 type).....\$26.00-\$26.50
No. 12 alum. (No. 2 grade).....\$23.50-\$24.75
108 alloy.....\$24.00-\$25.00
196 alloy.....\$26.50-\$27.00
13 alloy (0.60 copper max.).....\$26.00-\$26.50
AXS-679.....\$24.00-\$25.00

Steel deoxidizing aluminum, notch bar

granulated or shot

Grade 1—95-97 1/2%.....\$24.00-\$25.00
Grade 2—92-95%.....\$23.25-\$24.00
Grade 3—90-92%.....\$22.50-\$23.50
Grade 4—85-90%.....\$21.75-\$22.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper.....	32	31 1/2
Yellow brass.....	24 1/2	22 1/2
Red brass.....	28 1/2	27 1/2
Comm. bronze.....	29 1/2	28 1/2
Mang. bronze.....	23 1/2	22 1/2
Yellow brass rod ends.....	24 1/2	...

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....\$30
No. 2 copper wire.....\$28 1/2
Light copper.....\$26 1/2
Refinery brass.....\$27
*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire.....\$30
No. 2 copper wire.....\$28 1/2
Light copper.....\$26 1/2
No. 1 composition.....\$27 1/2
No. 1 comp. turnings.....\$27
Hvy. yellow brass solids.....\$20 1/2
Brass pipe.....\$20 1/2
Radiators.....\$22

Aluminum

Mixed old cast.....\$16 1/2—\$17 1/2
Mixed new clips.....\$17—\$18
Mixed turnings, dry.....\$16 1/2—\$17

Dealers' Scrap

(Dealers' buying price, f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire.....\$27—\$27 1/2
No. 2 copper wire.....\$25 1/2—\$26 1/2
Light copper.....\$23—\$23 1/2
Auto radiators (unsweated).....\$17 1/2—\$18
No. 1 composition.....\$23 1/2—\$24
No. 1 composition turnings.....\$22—\$22 1/2
Cocks and faucets.....\$18—\$18 1/2
Clean heavy yellow brass.....\$15—\$15 1/2
Brass pipe.....\$19—\$19 1/2
New soft brass clippings.....\$20 1/2—\$21
No. 1 brass rod turnings.....\$18—\$18 1/2

Aluminum

Alum. pistons and struts.....\$6 1/2—\$7
Aluminum crankcases.....\$11 1/2—\$12
1100 (2S) aluminum clippings.....\$14 1/2—\$15
Old sheet and utensils.....\$11 1/2—\$12
Borings and turnings.....\$8—\$8 1/2
Industrial castings.....\$11 1/2—\$12
2024 (24S) clippings.....\$13—\$13 1/2

Zinc

New zinc clippings.....\$7—\$7 1/2
Old zinc.....\$4 1/2—\$5
Zinc routings.....\$2 1/2—\$3
Old die cast scrap.....\$2 1/2—\$2 3/4

Nickel and Monel

Pure nickel clippings.....\$1.75-\$1.85
Clean nickel turnings.....\$1.50-\$1.60
Nickel anodes.....\$1.75-\$1.85
Nickel rod ends.....\$1.75-\$1.85
New Monel clippings.....\$7.50-\$8.00
Clean Monel turnings.....\$80-\$90
Old sheet Monel.....\$70-\$80
Nickel silver clippings, mixed.....\$21
Nickel silver turnings, mixed.....\$18

Lead

Soft scrap lead.....\$12 1/2—\$13
Battery plates (dry).....\$7—\$7 1/2
Batteries, acid free.....\$4 1/2

Miscellaneous

Block tin.....\$80—\$81
No. 1 pewter.....\$62 1/2—\$63
Auto babbitt.....\$42—\$42 1/2
Mixed common babbitt.....\$13—\$13 1/2
Solder joints.....\$18—\$18 1/2
Siphon tops.....\$42
Small foundry type.....\$15 1/2—\$15 1/2
Monotype.....\$14 1/2—\$15
Lino. and stereotype.....\$13—\$13 1/2
Electrotype.....\$12 1/2—\$12 1/2
Hand picked type shells.....\$10—\$10 1/2
Lino. and stereo. dross.....\$5 1/2—\$5 1/2
Electro. dross.....\$4 1/2—\$4 1/2

IRON AGE		Italics identify producers listed in key at end of table. Base prices, f.a.b. mill, in cents per lb., unless otherwise noted. Extras apply.												
STEEL PRICES (Effective Nov. 27, 1956)		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton		Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			\$107.00 B3		5.05 B3	7.40 B3	5.05 B3						
	Buffalo, N. Y.	\$74.00 B3, R3	\$91.50 B3, R3	\$107.00 B3, R3	5.90 B3	5.05 B3	7.40 B3	5.05 B3	4.875 B3, R3	6.85 R7	6.95 B3			
	Claymont, Del.													
	Harrison, N. J.													14.55 C11
	Conschocken, Pa.		\$96.50 A2	\$114.00 A2					4.725 A2	6.90 A2	6.95 A2			
	New Bedford, Mass.									7.30 R6				
	Johnstown, Pa.	\$74.00 B3	\$91.50 B3	\$107.00 B3		5.05 B3	7.40 B3							
	Boston, Mass.									7.40 T8				14.90 T8
	New Haven, Conn.									7.30 D1				
	Baltimore, Md.									6.85 T8				
	Phoenixville, Pa.					5.85 P2		5.85 P2						
	Sparrows Pt., Md.								4.675 B3		6.95 B3			
MIDDLE WEST	Bridgeport, Wallingford, Conn.	\$79.00 N8	\$96.50 N8	\$107.00 N8						7.30 W1 6.95 N8				
	Pawtucket, R. I. Worcester, Mass.									7.48 A5, N7				14.90 N7
	Alton, Ill.								4.875 L1					
	Ashland, Ky.								4.675 A7					
	Canton-Massillon, Dover, Ohio		\$94.00 R3	\$107.00 R3, T5						6.85 G4		10.10 G4		14.55 G4
	Chicago, Ill. Franklin Park, Ill.	\$74.00 U1, R3	\$91.50 U1, R3, W8	\$107.00 U1, R3, W8	5.90 U1	5.00 U1, W8	7.35 U1, Y1 6.00 W8	5.00 U1	4.675 N4 4.675 A1	6.95 A1, T8			7.75 W8 S9	14.55 A1, S9, T8
	Cleveland, Ohio									6.85 A5, J3			7.75 J3	
	Detroit, Mich.	\$74.00 R5		\$107.00 R5					4.775 G3, M2	6.95 M2, G3, D2, P11	7.05 G3	10.10 G3, S1, D2	7.05 G3	
	Anderson, Ind.									6.85 G4		10.10 G4		
	Duluth, Minn.													
	Gary, Ind. Harbor, Indiana	\$74.00 U1	\$91.50 U1	\$107.00 U1, Y1	5.90 J3	5.00 U1	7.35 U1, J3	5.00 J3	4.675 U1, J3, Y1	5.85 Y1	6.95 U1, J3, Y1	10.20 Y1	7.75 U1, Y1	
	Sterling, Ill.	\$74.00 N4							4.775 N4					
WEST	Indianapolis, Ind.									7.90 C5				
	Newport, Ky.												7.75 N5	
	Middletown, Ohio													
	Niles, Warren, Ohio Sharon, Pa.		\$91.50 S1, C10	\$107.00 S1, C10					4.675 S1, R3	6.85 T4	6.95 S1, R3	10.00 S1, R3	7.75 S1	14.55 S1
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	\$74.00 U1, J3	\$91.50 U1, J3, C11	\$107.00 U1, C11	5.90 U1	5.00 U1, J3	7.35 U1, J3	5.00 U1	4.675 P6	5.750 P6 6.85 J3, B4, S7			7.75 S9	14.55 S9
	Portsmouth, Ohio													
	Weirton, Wheeling, Follansbee, W. Va.					5.00 W3			4.675 W3	6.85 W3, F3	6.95 W3	9.65 W3		
	Youngstown, Ohio	\$74.00 R3	\$91.50 Y1, C10	\$107.00 Y1		5.00 Y1	7.35 Y1		4.675 U1, Y1	6.85 Y1, C5	6.95 U1, Y1	10.20 Y1	7.75 U1, Y1	
	Fontana, Cal.	\$83.50 K1	\$101.00 K1	\$128.00 K1		5.70 K1	8.05 K1	5.85 K1	5.475 K1	8.50 K1				
	Geneva, Utah	\$91.50 C7				5.00 C7	7.35 C7							
	Kansas City, Mo.					5.10 S2	7.45 S2		4.925 S2		7.20 S2			
	SOUTH	Los Angeles, Torrance, Cal.		\$101.00 B2	\$127.00 B2		5.70 C7, B2	8.05 B2		5.425 B2, C7	8.80 C1			8.95 B2
Minnequa, Colo.						5.30 C6			5.775 C6					
Portland, Ore.						5.75 O2								
San Francisco, Niles, Pittsburg, Cal.			\$101.00 B2			5.65 B2	8.00 B2		5.425 C7, B2					
Seattle, Wash.			\$105.00 B2			5.75 B2	8.10 B2		5.675 B2					
Atlanta, Ga.									4.875 A8					
Fairfield, Ala. City, Birmingham, Ala.		\$74.00 T2	\$91.50 T2			5.90 T2, R3 5.30 C16	7.35 T2		4.675 T2, R3 4.975 C16		6.95 T2			
Houston, Lone Star, Texas		\$80.00 L3	\$96.50 S2	\$112.00 S2		5.10 S2	7.45 S2		4.925 S2		7.20 S2			

IRON AGE

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

STEEL PRICES

(Effective
Nov. 27, 1956)

STEEL PRICES (Effective Nov. 27, 1956)		SHEETS								WIRE ROD	TINPLATE†		BLACK PLATE	
		Hot-rolled 18 ga. & heavy.	Cold- rolled	Galvanized	Enamel- ing	Long Tens	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.	Hot- rolled 19 ga.		Cokes* 1.25-lb. base box	Electro* 0.25-lb. base box	Hollowware Enameling 29 ga.
EAST	Bethlehem, Pa.													
	Buffalo, N. Y.	4.675 B3	5.75 B3				6.90 B3	8.525 B3			5.80 W6	† Special coated mfg. terms deduct 50¢ from 1.25-lb. coke base box price. Can-making quality blackplate 55 to 128 lb. deduct .220 from 1.25-lb. coke base box. * COKES: 1.50-lb. add 25¢. ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add \$1.00. Differ- ential 1.00 lb./0.25 lb. add 65¢.		
	Claymond, Del.													
	Coatesville, Pa.													
	Conshohocken, Pa.	4.725 A2	5.80 A2				6.95 A2							
	Harrisburg, Pa.													
	Hartford, Conn.													
	Johnstown, Pa.										5.80 B3			
	Fairless, Pa.	4.725 U1	5.80 U1				6.95 U1	8.575 U1				\$9.80 U1	\$8.50 U1	
	New Haven, Conn.													
	Phoenixville, Pa.													
Sparrows Pt., Md.	4.675 B3	5.75 B3	6.30 B3			6.90 B3	8.575 B3	9.275 B3		5.90 B3	\$9.80 B3			
Worcester, Mass.										6.10 A5				
Trenton, N. J.														
MIDDLE WEST	Alton, Ill.										6.00 L1			
	Ashland, Ky.	4.675 A7		6.30 A7	6.325 A7									
	Centon-Massillon, Dover, Ohio			6.30 R3, R1										
	Chicago, Joliet, Ill.	4.675 W8, A1					6.90 U1			5.80 K2	5.80 A5, R3, N4, W8, K2			
	Sterling, Ill.										5.90 N4, K2			
	Cleveland, Ohio	4.675 J3, R3	5.75 J3, R3		6.325 R3		6.90 R3	8.525 R3, J3			5.80 A5			
	Detroit, Mich.	4.775 G3, M2	5.85 G3 5.75 M2				7.00 G2	8.625 G3						
	Newport, Ky.	4.675 A9	5.75 A9											
	Gary, Ind. Harbor, Indiana	4.675 U1, J3, Y1	5.75 U1, J3, Y1	6.30 U1, J3	6.325 U1, J3, Y1	6.70 U1	6.90 U1, Y1, J3	8.525 U1, Y1			5.80 Y1	\$9.70 U1, Y1	\$8.40 J3, U1, Y1	7.15 U1, Y1
	Granite City, Ill.	4.875 G2	5.95 G2	6.50 G2	6.525 G2								\$8.50 G2	7.25 G2
	Kokomo, Ind.			6.40 C9							5.90 C9			
WEST	Mansfield, Ohio		5.75 E2			6.70 E2								
	Middletown, Ohio		5.75 A7	6.30 A7	6.325 A7	6.70 A7								
	Niles, Warren, Ohio Sharon, Pa.	4.675 S1, R3, N3	5.75 R3	6.30 R3	6.325 N3	6.70 N3	6.90 S1, R3	8.525 S1, R3				\$8.40 R3		
	Pittsburgh, Pa. Midland, Pa. Butler, Pa.	4.675 U1, J3, P6	5.75 U1, J3, P6	6.30 U1, J3	6.325 U1		6.90 U1, J3, R3	8.525 U1, J3	9.275 U1		5.80 A5, P6, J3	\$9.70 J3, U1	\$8.40 U1	7.15 U1
	Paris, Ohio	4.675 P7	5.75 P7								5.80 P7			
	Weirton, Wheeling, Follansbee, W. Va.	4.675 W3, W3	5.75 W3, W5, F3	6.30 W3, W5		6.70 W3, W5	6.90 W3	8.525 W3				\$9.60 W5	\$8.30 W5	7.15 W3 7.40 W3
	Youngstown, Ohio	4.675 U1, Y1	5.75 Y1		6.325 Y1		6.90 Y1	8.525 Y1			5.80 Y1			7.15 Y1
	Fontana, Cal.	5.475 K1	6.95 K1				7.70 K1	9.725 K1				\$10.35 K1	\$9.85 K1	
	Geneva, Utah	4.775 C7												
	Kansas City, Mo.										6.05 S2			
	Los Angeles, Torrance, Cal.										6.00 B2			
Minneapolis, Colo.										6.05 C6				
San Francisco, Niles, Pittsburg, Cal.	5.375 C7	6.70 C7	7.05 C7							6.45 C7	\$10.45 C7	\$9.15 C7		
Seattle, Wash.														
SOUTH	Atlanta, Ga.													
	Fairfield, Ala. Alabama City, Ala.	4.675 T2, R3	5.75 T2, R3	6.30 T2, R3							5.80 T2, R3	\$9.80 T2	\$8.50 T2	
	Houston, Tex.										6.05 S2			

IRON AGE

STEEL
PRICES(Effective
Nov. 27, 1956)

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon † Steel	Reinforc- ing	Cold Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	
EAST	Bethlehem				6.125 B3	8.325 B3	7.40 B3					
	Buffalo, N. Y.	5.075 B3,R3	5.075 B3,R3	6.90 B5	6.125 B3,R3	8.325 B5,B3	7.40 B3	4.85 B3				7.20 W6
	Claymont, Del.							5.35 C4		6.85 C4	7.55 C4	
	Coatesville, Pa.							5.25 L4		6.85 L4	7.55 L4	
	Conschocken, Pa.							4.90 A2	5.925 A2	6.25 A2	7.25 A2	
	Harrisburg, Pa.							5.80 P2	6.275 C3			
	Hartford, Conn.			7.35 R3		8.625 R3	7.40 B3					
	Johansstown, Pa.	5.075 B3	5.075 B3		6.125 B3			4.85 B3		6.85 B3	7.25 B3	7.20 B3
	Fairless, Pa.	5.225 U1	5.225 U1		6.275 U1							
	Newark, N. J.			7.30 W10		8.50 W10						
	Camden, N. J.			7.30 P10		8.50 P10						
	Bridgeport, Conn. Putnam, Conn.	5.30 N8	5.30 N8	7.20 N8 7.40 W10	6.20 N8	8.475 N8	7.50 N8					
MIDDLE WEST	Sparrows Pt., Md.		5.075 B3					4.85 B3		6.85 B3	6.85 B3	7.30 B3
	Palmer, Worcester, Needville, Mass. Milton, Pa.	5.225 M7	5.225 M7	7.40 B5,C14		8.325 A5 8.625 B5						7.50 A5,W6 9.025 T8
	Spring City, Pa.			7.30 K4		8.50 K4						
	Alton, Ill.	5.275 L1										7.40 L1
	Ashland, Newport, Ky.							4.85 A7,N5		6.85 N5		
	Canton, Massillon, Ohio			6.85 R3,R2	6.125 R3,T5	8.325 R3,R2, T5						
	Chicago, Joliet, Ill.	5.075 U1,R3, W8,N4 5.575 P13	5.075 U1,R3, N4 5.575 P13	6.85 A5,B5, W10,L2 W8,L2,N9	6.125 U1,R3, W8	8.325 A5,B5, W8,L2,N9, W10	5.875 W8	4.85 U1,I3, W8,A1	5.925 U1	6.85 U1,W8	7.25 U1	7.20 A5,K2, R3,N4,W7
	Cleveland, Ohio	5.075 R3	5.075 R3	6.85 A5,C13		8.325 A5,C13	7.425 R3	4.95 J3,R3	5.925 J3		7.25 J3,R3	7.20 A5, C13
	Detroit, Mich.	5.175 G3	5.425 G3	7.05 B5,P8 7.10 P3 6.85 R5	6.225 G3	8.525 B5,P3, P8 8.325 R5	7.525 G3	4.95 G3		6.90 G3		
	Duluth, Minn.											7.20 A5
	Gary, Ind. Harbor, Crawfordsville	5.075 U1,I3, Y1	5.075 U1,I3, Y1	6.85 R3,M5	6.125 U1,I3, Y1	8.325 R3,M4	7.425 U1,I3, Y1	4.85 U1,I3, Y1	5.925 I3	6.85 U1,Y1	7.25 U1,Y1	7.30 M4
	Granite City, Ill.							5.85 G2				
	Kokomo, Ind.											7.30 C9
WEST	Sterling, Ill.	5.525 N4	5.175 N4									7.30 K2
	Niles, Warren, Ohio Sharon, Pa.			6.85 C10	6.125 C10,S1	8.325 C10	7.425 S1	4.85 S1,R3		6.85 S1	7.25 S1,R3	
	Pittsburgh, Pa. Midland, Pa.	5.075 U1, C11,J3	5.075 U1,J3	6.85 A5,C8, J3,R3,S9, B4,W10	6.125 U1,C11	8.325 A5,R3, S9,C8,W10, C11	7.425 U1,J3	4.85 U1,J3	5.925 U1	6.85 U1,J3	7.25 U1,J3	7.20 A5,J3, P6
	Portsmouth, Ohio											7.20 P7
	Wairton, Wheeling, Fellansboro, W. Va.							4.85 W5				
	Youngstown, Ohio	5.075 U1, Y1,R3	5.075 U1, Y1,R3	6.85 U1,Y1, F2	6.125 U1,Y1	8.325 Y1,F2	7.425 U1,Y1	4.85 U1,Y1, R3		6.85 Y1	7.25 Y1	7.20 Y1
	Emeryville, Cal.	5.825 J5	5.825 J5									
	Fantana, Cal.	5.775 K1	5.775 K1		7.175 K1		8.125 K1	5.55 K1		7.55 K1	7.95 K1	
	Geneva, Utah	5.175 C7						4.85 C7			7.25 C7	
	Kansas City, Mo.	5.325 S2	5.325 S2		6.375 S2		7.075 S2					7.45 S2
	Los Angeles, Torrance, Cal.	5.775 C7,B2	5.775 C7,B2	8.30 R3	7.175 B2		8.125 B2					8.15 B2
	Minnequs, Colo.	5.525 C6	5.525 C6					5.70 C6				7.45 C6
	Portland, Ore.	5.825 O2	5.825 O2									
SOUTH	San Francisco, Niles, Pittsburgh, Cal.	5.775 C7,P9 5.825 B2	5.775 C7,P9 5.825 B2				8.175 B2					8.15 C7,C6
	Seattle, Wash.	5.825 B2 5.825 N6	5.825 B2				8.175 B2	5.75 B2		7.75 B2	8.15 B2	
	Atlanta, Ga.	5.575 A8										7.40 A8
	Fairfield, Ala. City, Birmingham, Ala.	5.075 T2,R3 5.375 C16	5.075 T2,R3 5.375 C16				7.425 T2	4.85 T2,R3			7.25 T2	7.20 T2,R3
	Houston, Ft. Worth, Lone Star, Tex.	5.325 S2	5.325 S2		6.375 S2		7.675 S2	4.95 S2 5.20 L3		6.95 S2	7.35 S2	7.45 S2

† Merchant Quality—Specialty Quality .35¢ higher.

November 29, 1956

Steel Prices (Effective Nov. 27, 1956)

Key to Steel Producers

With Principal Offices

- A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Coughohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angell Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire Spencer Steel Div., Birdsboro, Pa.
C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C3 Central Iron & Steel Co., Harrisburg, Pa.
C4 Claymont Products Dept., Claymont, Del.
C5 Cold Metals Products Co., Youngstown, O.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shifting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C12 Cumberland Steel Co., Cumberland, Md.
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shifting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thordale, Pa.
C16 Connors Steel Div., Birmingham
C17 Chester Blast Furnace, Inc., Chester, Pa.
D1 Detroit Steel Corp., Detroit
D2 Detroit Tube & Steel Div., Detroit
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.
D5 Henry Danton Div., Philadelphia
E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Steel Co., Mansfield, O.
F1 Fifth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown

- F3 Follanabee Steel Corp., Follanabee, W. Va.
G7 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
H1 Hanna Furnace Corp., Detroit
I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland
J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.
K1 Kaiser Steel Corp., Fontana, Cal.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.
L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.
M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid-States Steel & Wire Co., Crawfordsville, Ind.
M5 Monarch Steel Div., Hammond, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N3 Niles Rolling Mill Div., Niles, O.
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crasby Steel Co., Pawtucket, R. I.
N8 Northeastern Steel Corp., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.
O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland
P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit

- P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
R1 Reeves Steel & Mfg. Co., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebbing Sons Co., John A., Trenton, N. J.
R5 Rotary Electric Steel Co., Detroit
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.
S1 Dearborn Div., Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S6 Standard Forging Corp., Chicago
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Corp., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston
U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham
W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pt) f.o.b. mills. Base price about \$200 per net ton.

	BUTTWELD														SEAMLESS									
	1/2 In.		3/4 In.		1 In.		1 1/4 In.		1 1/2 In.		2 In.		2 1/2-3 In.		2 In.		2 1/2 In.		3 In.		3 1/2-4 In.			
	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.	Bk.	Gal.		
STANDARD T. & C.																								
Sparrows Pt. B3	10.50	+4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75										
Youngtown R3	12.50	+2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75										
Fontana K1	0.00	+15.25	3.00	+8.25	5.50	+7.75	8.00	+7.00	8.50	+6.00	9.00	+5.50	10.50	+5.75										
Pittsburgh J3	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25		
Alton, Ill. L1	10.50	-4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75										
Sharon M3	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75										
Fairless N2	10.50	-4.75	13.50	+0.75	16.00	2.75	18.50	3.50	19.00	4.50	19.50	5.00	21.00	4.75										
Pittsburgh N1	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25		
Wheeling W3	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75										
Wheatland W4	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75										
Youngtown Y1	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25		
Indiana Harbor Y1	11.50	-5.75	14.50	1.25	17.00	3.75	19.50	4.50	20.00	5.50	20.50	6.00	22.00	5.75										
Lorain N2	12.50	-2.75	15.50	1.25	18.00	4.75	20.50	5.50	21.00	6.50	21.50	7.00	23.00	6.75	+2.00	+17	4.50	+12.25	7.00	+9.75	8.50	+8.25		
EXTRA STRONG																								
PLAIN ENDS																								
Sparrows Pt. B3	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75										
Youngtown R3	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75										
Fairless N2	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75										
Fontana K1	4.50		8.50		10.50		11.00		11.50		12.00		12.50		+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25		
Pittsburgh J3	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25		
Alton, Ill. L1	15.00	1.25	19.00	5.25	21.00	8.75	21.50	7.50	22.00	8.50	22.50	9.00	23.00	7.75										
Sharon M3	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75										
Pittsburgh N1	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25		
Wheeling W5	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75										
Wheatland W4	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75										
Youngtown Y1	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25		
Indiana Harbor Y1	16.00	2.25	20.00	6.25	22.00	9.75	22.50	8.50	23.00	9.50	23.50	10.00	22.00	8.75										
Lorain N2	17.00	3.25	21.00	7.25	23.00	10.75	23.50	9.75	24.00	10.50	24.50	11.00	25.00	9.75	+0.50	+14.50	7.00	+8.75	9.50	+6.25	14.50	+1.25		

Threads only, butt weld and seamless 2 1/4 pt. higher discount. Plain ends, butt weld and seamless, 3-in. and under, 5 1/2 pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: 1/2, 3/4 and 1-in., 2 pt.; 1 1/4, 1 1/2 and 2-in., 1 1/2 pt.; 2 1/2 and 3-in., 1 pt.; e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2 1/2 and 3" pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 13.50¢ per lb.

TOOL STEEL

F.o.b. mill	W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	—	\$1.68	T-1
18	4	1	—	—	5	2.385	T-4
18	4	2	—	—	—	1.845	T-2
1.5	4	1.5	8	—	—	1.04	M-1
6	4	3	6	—	—	1.43	M-3
6	4	2	5	—	—	1.185	M-2

High-carbon chromium... .83 D-3, D-5
Oil hardened manganese .45 O-2
Special carbon .41 W-1
Extra carbon .345 W-1
Regular carbon .29 W-1
Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb. f.o.b.

Cladding	Plate (A3, J2, L6)			Sheet (J2)
	10 pct	15 pct	20 pct	
302				33.25
304	34.60	38.00	41.50	35.25
316	39.70	43.20	46.65	52.25
321	36.35	39.80	43.50	42.00
347	39.50	43.95	48.45	51.00
405	29.29	33.15	37.05	
419, 439	28.70	32.65	36.55	

CR Strip (89) Copper, 10 pct, 2 sides, 40.65; 1 side, 33.40.

ELECTRICAL SHEETS

22-Gage F.A.B. Mill Cents Per Lb	Hot-Rolled (Cut Length)*	Cold-Reduced (Coiled or Cut Length)	
		Semi-Processed	Fully Processed
Field.....	9.90	9.20	.....
Armature.....	10.35	10.35	10.85
Elect.....	11.00	11.025	11.525
Motor.....	12.05	12.075	12.575
Dynamo.....	13.05	13.05	13.55
Trans. 72.....	14.05	14.05	14.55
Trans. 65.....	14.60		
Trans. 58.....	15.10	Grain Oriented	
Trans. 52.....	16.15	Trans. 80.....	18.50
		Trans. 73.....	19.00

Producing points: Beech Bottom (W3); Brackenridge (A3); Granite City (G2); Indiana Harbor (I3); Mansfield (E2); Newport, Ky. (N5); Niles, O. (N3); Vandergrift (U1); Warren, O. (R3) (20¢ higher, HR); Zanesville, Butler (A7).

LAKE SUPERIOR ORES

51.50% Fe natural content, delivered lower Lake ports. Prices for 1956 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	\$12.10
Old range, bessemer	11.25
Old range, nonbessemer	11.10
Menabi, bessemer	11.00
Menabi, nonbessemer	10.85
High phosphorus	10.85

MERCHANT WIRE PRODUCTS

F.A.B. Mill	Standard Q Coated Nails						Fence Wire	Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barb Wire	Merch. Wire Ann'd	Merch. Wire Galv.
	Col	Col	Col	Col	Col	Col						
Alabama City R3.....	167	181	195	187	6.10	8.50						
Albion, Pa. J3**.....	164	178	192	181	7.95	8.475						
Atlanta A8**.....	166	182	192	190	8.05	8.65						
Bartonville K2**.....	166	182	192	190	8.05	8.65						
Buffalo W6.....	164	176	190	184	7.95	8.50						
Chicago, Ill. N4**.....	164	180	190	189	7.95	8.55						
Cleveland A6.....	173	187	199	198	8.10							
Crawfordsville M4**.....	164	182	192	190	8.05	8.65						
Danora, Pa. A5.....	164	176	190	184	7.95	8.35						
Duluth A5.....	164	176	190	184	7.95	8.35						
Fairfield, Ala. T2.....	164	176	190	184	7.95	8.35						
Galveston D4.....	164	176	190	184	7.95	8.35						
Houston S2.....	169	181	195	189	8.20	8.60						
Johnstown, Pa. B3**.....	164	180	190	188	7.95	8.55						
Joliet, Ill. A5.....	164	176	190	184	7.95	8.35						
Kokomo, Ind. C9*.....	166	178	192	186	8.05	8.45						
Los Angeles B2**.....	169	181	195	189	8.20	8.60						
Kansas City S2*.....	169	181	195	189	8.20	8.60						
Minneapolis C6†.....	169	181	195	189	8.20	8.60						
Minneapolis P6.....	167	185	195	191	8.10	8.10						
Pittsburg, Cal. C7.....	186	199	204	204	8.90	9.30						
Portsmouth P7.....	164	176	190	184	7.95	8.35						
Rankin, Pa. A5.....	164	176	190	184	7.95	8.35						
So. Chicago R3.....	167	181	195	187	8.10	8.50						
S. San Francisco C6.....	164	176	190	184	7.95	8.35						
Sparrows Pt. B3**.....	166	178	192	186	8.05	8.45						
Struthers, O. Y1*.....	170	182	192	190	8.45	8.45						
Worcester A5.....	170	182	192	190	8.45	8.45						
Williamsport, Pa. S5.....	175	187	197	195	8.25	8.65						

* Zinc less than .10%. † Plus zinc extras.
** 13.5 zinc. ‡ Wholesalers only.
*** .10% zinc.

C-R SPRING STEEL

Cents Per Lb F.A.B. Mill	CARBON CONTENT				
	0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Baltimore, Md. T8.....	8.25	10.10	12.90	15.30	18.25
Bristol, Conn. W12.....	8.25	10.10	12.90	15.30	18.25
Boston T8.....	8.50	10.10	12.90	15.30	18.25
Buffalo, N. Y. R7.....	7.95	9.80	12.60	15.00	17.95
Carnegie, Pa. S9.....	7.95	9.80	12.60	15.00	17.95
Cleveland A5.....	7.95	9.80	12.60	15.00	17.95
Detroit D1.....	8.05	9.90	12.70	15.10	
Detroit D2.....	8.05	9.90	12.70	15.10	
Dover, O. G6.....	7.95	9.80	12.60	15.00	17.95
Franklin Park, Ill. T8.....	8.05	9.80	12.60	15.00	17.95
Harrison, N. J. C11.....	8.10	9.95	12.90	15.30	18.25
Indianapolis C3.....	8.10	9.95	12.90	15.30	18.25
New Castle, Pa. B4.....	7.95	9.80	12.60	15.00	
New Haven, Conn. D1.....	8.40	10.10	12.90	15.30	
Pawtucket, R. I. N7.....	8.50	10.10	12.90	15.30	18.25
Pittsburgh S7.....	7.95	9.80	12.60	15.00	17.95
Riversdale, Ill. A1.....	8.05	9.80	12.60	15.00	17.95
Sharon, Pa. S1.....	7.95	9.80	12.60	15.00	17.95
Trenton R4.....	8.10	10.10	12.90	15.30	18.25
Wallingford W1.....	8.40	10.10	12.90	15.30	18.15
Warren, Ohio T4.....	7.95	9.80	12.60	15.00	17.95
Weirton, W. Va. W3.....	7.95	9.80	12.60	15.00	17.95
Worcester, Mass. A5.....	8.50	10.10	12.90	15.30	18.25
Youngstown C5.....	7.95	9.80	12.60	15.00	17.95

† On Application.

BOILER TUBES

\$ per 100 ft. carload lots, cut 10 to 24 ft. F.A.B. Mill	Size					
	OD-In.	B.W. Ga.	H.R.	C.D.	H.R.	C.D.
Babcock & Wilcox.....	2	13	34.85	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
National Tube.....	2	13	34.85	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....
Pittsburgh Steel....	2	13	34.85	40.85	33.21	.....
	2½	12	46.98	55.01	44.73	.....
	3	12	54.24	63.53	51.66	.....
	3½	11	63.32	74.16	60.30	.....
	4	10	84.09	98.47	80.07	.....

WARE-HOUSES

Metropolitan Price, dollars per 100 lb.

WAREHOUSES		Sheets			Strip		Plates	Shapes	Bars		Alloy Bars			
City	City Delivery & Charge	Hot-Rolled 16 ga. & over	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn As rolled	Cold-Drawn 4140 Annealed
Atlanta.....		8.07	9.27	9.83	8.16	.....	8.40	8.44	8.30	10.14	.....	.....	.....	.....
Baltimore.....	\$.10	7.79	8.99	9.12	8.27	.....	8.12	8.57	8.34	9.09	14.99	14.44	18.39	18.09
Birmingham.....	.15	7.68	8.88	8.85	7.78	.....	8.01	8.05	7.91	10.04	.....	.....	.....	.....
Boston.....	.10	8.70	9.73	11.02	8.79	.....	8.98	8.90	8.88	10.71	15.05	14.45	18.51	18.10
Buffalo.....	.15	8.80	9.83	.....	8.89	.....	9.08	9.00	8.98	10.81	.....	.....	.....	.....
		7.90	9.05	10.87	8.15	.....	8.40	8.40	8.15	8.85	15.00	14.45	18.40	.....
Chicago.....	.15	7.78	8.90	9.70	7.78	.....	8.01	8.05	7.91	8.35	14.65	14.10	18.05	17.75
Cincinnati.....	.15	7.85	9.05	7.93	.....	.....	8.16	8.20	8.06	8.50	.....	.....	.....	.....
		7.97	9.04	9.90	8.21	.....	8.49	8.70	8.34	8.97	14.93	14.38	18.33	18.03
Cleveland.....	.15	7.68	8.88	9.60	7.88	.....	8.21	8.38	7.99	8.60	14.73	14.18	18.13	17.83
Denver.....		9.55	11.09	12.41	9.70	.....	9.80	9.60	9.75	16.54	.....	.....	19.79	.....
Detroit.....	.15	8.06	9.28	10.17	8.25	.....	8.48	8.70	8.33	8.83	14.04	.....	17.09	.....
Houston.....		8.70	9.65	.....	8.80	.....	8.60	8.90	8.45	10.55	15.50	.....	19.30	19.05
Kansas City.....	.20	8.52	9.72	10.07	8.60	.....	8.83	8.87	8.73	9.42	15.32	14.77	18.72	18.42
Los Angeles.....	.10	8.90	10.65	11.65	9.10	.....	9.35	8.95	8.80	11.70	15.85	15.35	19.70	19.45
Memphis.....	.15	8.02	9.22	.....	8.12	.....	8.35	8.39	8.25	9.85	.....	.....	.....	.....
Milwaukee.....	.15	7.82	9.02	9.82	7.90	.....	8.13	8.24	8.03	8.57	14.77	.....	18.17	17.87
New York.....	.10	8.45	9.63	10.33	8.91	.....	8.88	8.84	8.93	10.71	15.02	14.47	18.42	18.12
Norfolk.....	.20	8.00	.....	.....	8.40	.....	8.35	8.70	8.45	10.70	.....	.....	.....	.....
Philadelphia.....	.10	7.89	9.08	9.66	8.58	.....	8.28	8.38	8.37	9.12	14.80	14.15	18.20	17.90
Pittsburgh.....	.15	7.99	9.18	10.22	8.68	.....	8.38	8.48	8.47	9.22	14.80	14.25	18.20	17.90
		7.68	8.88	10.05	7.88	.....	8.01	8.29	7.91	8.60	14.65	13.80	18.05	16.85
						.....						14.10	18.10	17.75
Portland.....		8.90	9.65	11.40	9.05	.....	8.70	8.90	8.95	13.55	16.70	16.10	20.40	20.25
San Francisco.....	.10	8.75	10.30	10.80	8.95	.....	8.85	8.85	8.80	12.30	15.85	15.35	19.70	19.45
Seattle.....		9.35	10.45	11.55	9.50	.....	9.05	9.15	9.30	13.15	16.10	15.55	19.50	19.20
St. Louis.....	.15	8.02	9.21	10.03	8.11	.....	8.34	8.48	8.25	8.93	14.83	14.28	18.23	17.93
		8.17	9.49	10.18	8.26	.....	8.49	8.63	8.40	9.08	14.98	14.38	18.38	18.08
St. Paul.....	.15	8.29	9.64	10.31	8.39	.....	8.71	8.75	8.52	9.21	.....	14.62	.....	18.27

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb.	No. 1 Std. Rail	Light Rail	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Unthreaded
Bessemer UI	5.075	6.00	6.35				
So. Chicago R3				8.775			
Ensley T2	5.075	6.00					
Fairfield T2		6.00		8.775	6.025		
Gary UI	5.075	6.00			6.025		
Ind. Harbor T3	5.075		6.35	8.775	6.025		
Ind. Harbor Y3		6.00		8.775			
Johnstown B3				6.35			
Joliet UI	5.075				8.775		
Kansas City S2					8.775		
Lackawanna B3	5.075	6.00	6.35		6.025		
Lahabon B3						13.10	
Minneapolis C6	5.075	6.50	6.35	8.775	6.025	13.10	
Pittsburgh P3				8.775	12.85		
Pittsburgh B3						13.10	
Seattle B2				9.275		16.175	13.10
Steelton B3	5.075		6.35			6.025	13.10
Struthers Y1				8.775			
Torrance C7							
Williamsport S5	6.15						
Townsend R5				8.775			

COKE

Furnace, beehive (f.o.b. oven) Net-Ton
Connellsville, Pa. \$15.25 to \$16.75
Foundry, beehive (f.o.b. oven) ..
..... \$18.00 to \$19.00

Foundry, oven coke	
Buffalo, de'd	\$30.75
Detroit, f.o.b.	29.50
New England, de'd	30.55
Seaboard, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	28.50
Swedesland, Pa., f.o.b.	28.50
Painesville, Ohio, f.o.b.	29.50
Erie, Pa., f.o.b.	29.50
Cleveland, de'd	31.55
Cincinnati, de'd	28.59
St. Paul, f.o.b.	28.50
St. Louis, f.o.b.	30.50
Birmingham, f.o.b.	27.50
Milwaukee, f.o.b.	29.50
Lone Star, f.o.b.	25.50

ELECTRODES

Cents per lb f.o.b. plant, threaded, with
nipples, unboxed.

GRAPHITE			CARBON*		
Diam. (in.)	Length (in.)	Price	Diam. (in.)	Length (in.)	Price
24	84	24.75	40	100-110	10.70
20	72	24.00	35	110	10.70
16 to 18	72	24.50	30	110	10.85
14	72	25.00	24	72 to 84	11.25
12	72	25.50	20	90	11.00
10	60	26.50	17	72	11.40
8	48	27.00	14	72	11.85
7	60	26.75	12	60	12.95
6	60	30.00	10	60	13.00
4	40	33.25	8	60	13.50
3	40	35.25			
2 1/2	30	37.25			
2	24	57.75			

* Prices shown cover carbon nipples.

ELECTROPLATING SUPPLIES

Anodes	
(Cents per lb, f.o.b. plant, threaded, with nipples, unboxed)	
Copper	
Cast elliptical, 18 in. or longer, 5000 lb lots	57.43
Electrodeposited	45.23
Brass, 80-20, ball anodes, 2000 lb or more	58.00
Zinc, ball anodes, 2000 lb lots	21.25
(for elliptical add 3¢ per lb)	
Nickel, 99 pct plus, rolled carbon...	90.50
(rolled depolarized add 3¢ per lb)	
Cadmium	\$1.70
Tin, ball anodes and elliptical	\$1.10 to \$1.16
Chemicals	
(Cents per lb, f.o.b. shipping point)	
Copper cyanide, 100 lb drum	80.50
Copper sulphate, 5 or more 100 lb bags, per cwt.	30.85
Nickel salts, single, 100 lb bags	35.25
Nickel chloride, freight allowed, 300 lb	43.50
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	21.55
(Philadelphia price 21.80)	
Zinc cyanide, 100 to 900 lb	55.55
Potassium cyanide, 100 lb drum	48.00
N. Y.	
Chromic acid, flake type, 1 to 20 100 lb drums	29.25

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)
Pct Discounts

Machine and Carriage Bolts	Full Container Price	30 Containers	20,000 Lb.	40,000 Lb.
1/2" and smaller x 6" and shorter	55	58 1/2	60 1/2	61 1/2
1/2" thru 1" x longer than 6"	46 1/2	50	52 1/2	54
Rolled thread carriage bolts 1/2 in. & smaller x 6 in. and shorter	55	58 1/2	60 1/2	61 1/2
Lag, all diam. x 6" & shorter	55	58	60	61
Lag, all diam. longer than 6 in.	47	50	52	53
Plow bolts, 1/2" and smaller x 6" and shorter	54	57 1/2	59	60

(Add 25 pct for broken case quantities)

Nuts, Hex, HP reg. & hvy.	Full Case or Keg Price
1/2 in. or smaller	63
3/4 in. to 1 in. inclusive	59 1/2
1 1/4 in. to 1 1/2 in. inclusive	64
1 3/4 in. and larger	58

C.P. Hex regular & hvy.

1/2 in. and smaller	63
3/4 in. to 1 1/4 in. inclusive	59 1/2
1 1/2 in. and larger	58

Hot Galv. Nuts (All Types)

1/2" and smaller	50
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Semi-finished Hex Nuts

1/2 in. and smaller	63
3/4 in. to 1 1/4 in. inclusive	59 1/2
1 1/2 in. and larger	58

(Add 25 pct for broken case or keg quantities)

Finished

1" and smaller	65
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Rivets

	Base per 100 lb
1/2 in. and larger	\$10.85
7/16 in. and smaller	26 1/2

Cap Screws

	Discount (Packages)
	Bright Treated H. C. Heat

New std. hex head, pack-

aged	
1/2" diam. and smaller x 6" and shorter	47 34
3/4" 3/4" and 1" diam. x 6" and shorter	31 13
1/2" diam. and smaller x longer than 6"	18 1/2 + 1
3/4", 3/4" and 1" diam. & longer than 6"	5 1/2 + 19 1/2

C-1018 Steel
Full-Finished
Cartons Bulk

1/2" through 3/4" dia. x 6" and shorter	47 63
3/4" through 1" dia. x 6" and shorter	31 51 1/2
Minimum quantity—1/16" through 3/4" diam., 15,000 pieces; 1/16" through 3/4" diam., 5,000 pieces; 3/4" through 1" diam., 2,000 pieces.	

Machine Screws & Stove Bolts

	Discount	Machine Screws	Stove Bolts
Plain Finish		19	32
Cartons Bulk			
To 1/4" diam. incl.	Quantity	9	54
5/16 to 1/2" diam. incl.		9	54
All diam. over 3" long		—	54

Machine Screw & Stove Bolt Nuts

	Discount	Hex	Square
In cartons		16	19
In bulk			
1/2" diam. & smaller	Quantity	7	9

CAST IRON WATER PIPE INDEX

Birmingham	119.0
New York	131.4
Chicago	133.4
San Francisco-L. A.	140.2
Dec. 1955 value, Class B or heavier 6 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1 issue. Source: U. S. Pipe and Foundry Co.	

REFRACTORIES

Fire Clay Brick	Carloads per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5.00)	\$128.00
No. 1 Ohio	128.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	114.00
No. 2 Ohio	98.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$2.00)	20.00

Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$140.00
Childs, Hays, Pa.	145.00
Chicago District	150.00
Western Utah	144.00-165.00
California	170.00
Super Duty	
Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	150.00-157.00
Silica cement, net ton, bulk, Latrobe	26.50
Silica cement, net ton, bulk, Chicago	24.00
Silica cement, net tons, bulk, Ensley, Ala.	25.50
Silica cement, net ton, bulk, Mt. Union	23.00
Silica cement, net ton, bulk, Utah and Calif.	35.00

Chrome Brick

Standard chemically bonded, Balt.	\$98.00
Standards chemically bonded, Curtiner, Calif.	108.00
Burned, Balt.	92.00

Magnesite Brick

Standard, Baltimore	\$121.00
Chemically bonded, Baltimore	109.00

Grain Magnesite St. % to 1/4-in. grains

Domestic, f.o.b. Baltimore in bulk	\$69.40
Domestic, f.o.b. Chewah, Wash., Lunenburg, Nev.	43.00
in bulk	49.00
in sacks	49.00

Dead Burned Dolomite

F.o.b. bulk, producing points in:	
Pa. W. Va., Ohio	\$16.00
Midwest	16.35
Missouri Valley	15.00

METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh	
Swedish sponge iron f.o.b. Riverton, N. J., ocean bags	8.50¢
Canadian sponge iron, De'd in East, carloads	9.5¢
Domestic sponge iron, 98+% Fe, carload lots	8.5¢
Electrolytic iron, annealed, imported 99.5+% Fe	27.5¢
domestic 99.5+% Fe	36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0¢
Electrolytic iron melting stock, 99.84% pure	22.0¢
Carbonyl iron size 5 to 10 micron, 98%, 99.8+% Fe 86.0¢	11.55
Aluminum freight allowed	38.00¢
Brass, 10 ton lots	37.50¢ to 50.00¢
Copper, electrolytic	59.50¢
Copper, reduced	59.50¢
Cadmium, 100-199 lb, 95¢ plus metal value	
Chromium, electrolytic 99.85% min. Fe .03 max. De'd	\$5.00
Lead	8.90¢ plus metal value
Manganese	70.0¢
Molybdenum, 99%	\$3.35 to \$3.85
Nickel, unannealed	\$1.00
Nickel, annealed	\$1.00
Nickel, spherical, unannealed #80	\$1.13
Silicon	43.50¢
Solder power, .70¢ to 9.0¢ plus met. value	
Stainless steel, 302	99.0¢
Stainless steel, 316	\$1.32
Tin	14.00¢ plus metal value
Tungsten, 99% (65 mesh)	\$4.10
Zinc, 10 ton lots	18.75¢ to 32.50¢

Ferroalloy Prices

(Effective Nov. 27, 1956)

Ferrochrome

Contract prices, cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si.			
0.02% C	41.50	0.20% C	38.50
0.03% C	41.00	0.50% C	38.25
0.06% C	39.50	1.00% C	37.50
0.10% C	39.00	1.50% C	37.35
0.15% C	38.75	2.00% C	37.25
4.00-4.50% C, 67.70% Cr, 1-2% Si.	27.75		
3.50-5.00% C, 67-64% Cr, 2.00-4.50% Si	27.75		
0.025% C (Simplex)	34.75		
0.10% C, 50-52% Cr, 2% max Si.	35.75		
8.50% max. C, 50-55% Cr, 3-6% Si.	24.00		
8.50% C, 50-55% Cr, 3% max Si.	24.00		

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max 0.10% C price schedule. Add 5¢ for each additional 0.25% of N.

Chromium Metal

Contract prices, per lb chromium contained, packed, delivered, ton lots, 97% min. Cr, 1% max. Fe.	
0.10% max. C	\$1.31
0.50% max. C	1.31
9 to 11% C, 33-91% Cr, 0.75% Fe.	1.40

Electrolytic Chromium Metal

Contract prices per lb of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.	
Carloads	\$1.29
Ton lots	1.31
Less ton lots	1.33

Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-45%, C 0.05% max.) Contract price, carloads, delivered, lump, 3-in. x down, per lb of Cr, packed.	
Carloads	44.65
Ton lots	48.95
Less ton lots	51.45

Calcium-Silicon

Contract price per lb of alloy, lump, delivered, packed.	
30-33% Cr, 60-65% Si, 3.00 max. Fe.	
Carloads	25.65
Ton lots	27.95
Less ton lots	29.45

Calcium-Manganese-Silicon

Contract prices, cents per lb of alloy, lump, delivered, packed.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	24.35
Ton lots	26.15
Less ton lots	27.15

SMZ

Contract prices, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr. 20% Fe 1/2 in. x 12 mesh.	
Ton lots	20.15
Less ton lots	21.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 35-43% Cr., 17-19% Si, 8-11% Mn, packed.	
Carload lots	17.20
Ton lots	18.70
Less ton lots	19.95

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.	
Carload packed	18.50
Ton lots to carload packed	19.65
Less ton lots	20.90

Ferromanganese

Maximum contract base price, f.o.b., lump size, base content 74 to 76 pct Mn.

Producing Point	
Marietta, Ashabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.75
Johnstown, Pa.	11.75
Sheridan, Pa.	11.75
Philo, Ohio	11.75
S. Duquesne	11.75
Add or subtract 0.1¢ for each 1 pct Mn above or below base content.	
Briquets, delivered, 66 pct Mn:	
Carloads, bulk	13.90
Ton lots packed	15.30

Spiegeleisen

Contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.		
Manganese	Silicon	
16 to 19%	3% max.	\$57.50
19 to 21%	3% max.	99.50
21 to 23%	3% max.	102.00

Manganese Metal

Contract basis, 3 in. x down, cents per pound of metal, delivered.	
95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.	
Carload, packed	45.75
Ton lots	47.35

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.	
Carloads	33.00
Ton lots	35.00
250 to 1999 lb	37.00
Premium for hydrogen-removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max. Contract price, carloads, lump, bulk, delivered, per lb of contained Mn.	
	24.15

Low-Carb Ferromanganese

Contract price, cents per pound Mn contained, lump size, del'd Mn 85-96%.			
	Carloads	Ton	Less
0.07% max. C, 0.06% P, 90% Mn.	35.80	38.60	39.80
0.07% max. C	33.75	36.55	37.75
0.10% max. C	33.00	35.80	37.00
0.15% max. C	32.25	35.05	36.25
0.30% max. C	30.75	33.55	34.75
0.50% max. C	30.25	33.05	34.25
0.75% max. C, 80.85% Mn, 5.0-7.0% Si.	37.25	30.05	31.25

Silicomanganese

Contract basis, lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point.	
Carloads bulk	12.95
Ton lots	14.60
Briquet contract basis carloads, bulk, delivered, per lb of briquet	14.40
Ton lots, packed	16.80

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$100.00 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, packed.		
	Ton lots	Carloads
96.50% Si, 2% Fe	23.95	22.65
98% Si, 0.75% Fe	24.45	23.15

Silicon Briquets

Contract price, cents per pound of briquets, bulk, delivered, 40% Si, 1 lb Si.	
briquets, bulk	7.55
Ton lots, packed	10.35

Electric Ferrosilicon

Contract price, cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.			
50% Si	13.50	75% Si	16.40
65% Si	15.25	85% Si	18.10
	90% Si		19.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.		
	Cast	Turnings Distilled
Ton lots	\$2.05	\$3.95
Less ton lots	1.40	3.30

Ferrovandium

50-55% V contract, basis, delivered, per pound, contained V, carloads, packed.	
Openhearth	3.20
Crucible	3.30
High speed steel (Primos)	3.40

Alsilfer, 20% Al, 40% Si, 40% Fe. Contract basis, f.o.b. Suspension Bridge, N. Y., per lb.

Carloads	10.65¢
Ton lots	11.80¢

Calcium molybdate, 43.6-45.6% f.o.b. Langloeth, Pa., per pound contained Mo. \$1.28

Ferrocolumbium, 50-60%, 2 in. x D contract basis, delivered per pound contained Cb.

Ton lots	\$6.90
Less ton lots	6.95

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, contract basis, del'd, ton lots, 2-in. x D per lb cont Sb plus Ta. \$4.95

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langloeth, Pa., per pound contained Mo. \$1.54

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton \$90.00
10 tons to less carload \$110.00

Ferrotitanium, 40% regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti \$1.35

Ferrotitanium, 25% low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti \$1.50
Less ton lots \$1.55

Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload, per net ton \$215.00

Ferrotungsten, 1/4 x down, packed, per pound contained W, ton lots delivered \$2.15

Molybdenic oxide, briquets, per lb contained Mo, f.o.b. Langloeth, Pa. \$1.33

bagas, f.o.b. Washington, Pa. Langloeth, Pa. \$1.30

Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per lb. Carload, bulk lump \$18.50¢
Ton lots, packed lump \$20.50¢
Less ton lots \$21.00¢

Vanadium oxide, 86-89% V₂O₅ contract basis, per pound contained V₂O₅ \$1.33

Zirconium contract basis, per lb of alloy 35-40% f.o.b. freight allowed, carloads, packed \$27.25¢
12-15%, del'd lump, bulk-carloads \$28.25¢

Boron Agents

Borosil, contract prices per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B \$5.50
2000 lb carload

Bortam, f.o.b. Niagara Falls Ton lots, per pound \$45¢
Less ton lots, per pound \$50¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed
Ton lots per pound \$14.00¢

Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots \$1.20
F.o.b. Wash., Pa. Niagara Falls, N. Y., delivered 100 lb up
10 to 14% B .85
14 to 19% B 1.20
19% min. B 1.50

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over No. 1 \$1.05
No. 79 \$0.94

Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots \$1.46
Less ton lots 1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots \$2.05

RAILWAY EQUIPMENT FOR SALE

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For All Types of Cars

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Diesel, Steam, Gasoline,
Diesel-Electric

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LOCOMOTIVE CRANE

Standard Gauge 27½-Ton
Capacity

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CRANE

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or STEEL"**

THE CLEARING HOUSE

News of Used and Rebuilt Machinery

Confidence High . . . Used and rebuilt machinery sales continue excellent in the New York metropolitan area. Biggest problems are shortages of machines to sell, plus increasing handicap of tight money. Several firms are reported postponing purchasing plans in the face of high interest rates. But most dealers are confident that continued high metalworking activity will heighten need for better tools and provide the profits to pay for them in the near future.

Construction's Hot . . . Construction machinery is still the hottest branch of the market in this area. Equipment auctioned at a recent liquidation sale of a Utica structural fabricating works brought what one dealer calls "fabulous" prices. Especially wanted are bending rolls and roll formers, demand stemming from a quiet but intensive build-up in tank orders as a result of the Suez crisis. One dealer last week sold a bending roll he had held for over 5 years.

Construction activity has benefited from the continued good weather extending well into November. This has helped stave off the expected seasonal slump in building equipment sales. But construction backlogs remain so high that dealers think the present market should hold up even through winter blizzards.

Tool Room Goods Wanted . . . Demand for tool room equipment continues heavy, and appears to cover all types of precision tooling. Production equipment is a little slower, but appearance of more good, late-model tools would probably bring a marked upturn in inquiries. Some dealers in this area are speculating that discouraged customers are now reaching out into the Midwest for this type of machinery, bypassing depleted local sources.

Demand-No Supply . . . Crane demand is so hot it may have burnt itself out. "There just aren't any World War II or later cranes available," sighs one dealer. For prospective crane buyers, there seem to be only two expensive choices: 1. Try to buy in other areas, ship in at substantial cost; or, 2. Stand in line to get on the order books for a new crane. Neither solution is very attractive to most customers.

How Much Replacement? . . . Continuing shortage of good tools to sell in this area is perhaps the only real brake to far higher dealer sales. And there is, of course, no easy or quick answer to the problem. Record deliveries of new tools in recent months should bring more used equipment into the market this winter, but it is a very real question how many of these new tools are destined for replacement and how many for expansion.

There are some indications that tool buyers are turning again to foreign equipment. But imports are generally limited to special tools, complementing American machinery, rather than direct substitutions. And delivery times on many popular foreign tools are substantial, although in most cases not so long as for new American equipment.

Inquiries High . . . A considerable number of inquiries for automotive equipment are coming into Chicago from the East and the West Coast, but without much action resulting, simply because not a great deal of this equipment is being thrown on the market. Windup of automotive tooling for the 1957 models doesn't seem to have taken the pressure off available supplies, though dealers with Detroit contacts say they find activity somewhat less frantic.

CONSIDER GOOD USED EQUIPMENT FIRST

BENDER & STRAIGHTENER

2 1/2 H & J, Capacity 15" I-beams, 9" Girder Rail, 100 lb. Tee Rails, Motor Drive

BENDING ROLLS

8' x 3/16" Niagara Initial Type
8' x 3/16" Webb 120-V Vertical
10' x 1/2" Bertsch Initial Type
10' x 1/2" Kling Pyramid Type
12' x 3/8" Southwick Pyramid Type
16' x 3/8" Niles Pyramid Type
20' x 1" Hillies & Jones Pyramid Type

BRACKS—LEAF TYPE

10' x 3/16" Dreis & Krump
12' x 1/2" Dreis & Krump
12' x 3/8" Dreis & Krump

BRACKS—PRESS TYPE

10' x 1/2" Superior Hydraulic—NEW
12' x 1/2" Superior Hydraulic—NEW

CRANES—OVERHEAD ELECTRIC TRAVELING

5 ton Whiting 48' Span 230/3/60 A.C.
5 ton Shaw 56' Span 230 Volt D.C.
10 ton P&H 38' Span 230 Volt D.C.
10 ton Cyclops 40' Span 230/440 A.C.
15 ton P&H 46' Span 230 Volt D.C.
15 ton P&H 48' Span 230 Volt D.C.
15 ton P&H 72' Span 230 Volt D.C.
25 ton L-B 75' Span 230/3/60 A.C.
Incl. 300 ft. Runway
80 ton Niles 72' Span 230 Volt D.C.
120 ton Niles 68' Span 440/3/60 A.C.

FORGING MACHINES

1" to 5" Acme, Ajax, National
2" Ajax—Air Clutch

HAMMERS—BROAD DROP—STEAM DROP—STEAM

FORGING—800 lb. to 20,000 lb.

LEVELLERS—ROLLER

44" Newbold, Nine Rolls 4" Dia.
48" Kane & Bosch, 11 Rolls 4" O.D.
54" Aetna Standard, 17 Rolls 3 3/8" Dia.
72" McKay, 17 Rolls 4 1/4" Dia.

PRESSES—HYDRAULIC

500 ton Elmes 18" Stroke Lower Platen 38" x 66"
750 ton Baldwin Triple Acting Bolster 84" x 133"
1200 ton United Steam Hydraulic Forging Press
4500 Baldwin-Lima-Hamilton Hydr. Forging Press

PRESSES—HYDRAULIC WHEEL

600 ton N-B-P, 96" Between Strain Bars
800 ton N-B-P, 96" Between Strain Bars

PRESS—INCLINED

123 ton Beatty Open Back, 1 1/2" Stroke. Area of Bed 28 1/2" x 26 1/2"

PRESSES—STRAIGHT SIDE

Clearing Model TF41500-200 Triple Acting Strokes
40, 32, 14", Bed Area 100" x 200"
100 ton Clearing 14" Stroke, 36" x 36" Bed
250 ton Bliss, 16" Stroke, 29" x 29" Bed
250 ton Toledo, 6" Stroke, 36" x 72" Bed

PUNCH & SHEAR COMBINATIONS

ME-10 Pels Ironworker, Capacity Punch 3/4" x 1 1/2",
Shear 1 1/2" Rd., 1 1/2" Sq., 3 x 3 x 3/4" Angler
244 x 48 Buffalo RAP, Capacity 1/2" x 3/4"
Cleveland Style G Single End, 60" Throat
No. 1 1/2 Buffalo Universal Ironworker

ROLLS—PLATE STRAIGHTENING

72" Bertsch Seven Rolls, 7 1/2" Dia.
46" H & J, Six Rolls 10" Dia.
12" Newbold, Nine Rolls 14" Dia.

ROLLING MILLS

9" Three High Bar Mill
18" Three High Bar Mill
10" x 16" Single Stand, Two High
12" x 14" Twelve Stand, Two High Strip Mill
12" x 16" Phila. Single Stand, Two High
16" x 24" Parrel Two Stand, Two High
26" x 54" United Single Stand, Two High
36" x 72" Cold Rolling Mill
44" x 144" Three High Sheet Mill
22" x 40" Three High Sheet Mill

SHEARS—GATE

80" x 1 1/2" Pels Model 8 T A U—22, All Steel
96" x 3/4" Beatty

SHEARS—ROTARY

23A Quickwork Whiting, 3/16" Capy.
2250 Kling, 1/2" Capy.

SHEAR—SQUARING

16' x 1 1/2" Toledo

SLITTERS

12" Blake & Johnson
21" Custom Built Slitting Line
32" Stancu Slitting Line

SWAGING MACHINE

8 1/2" A. Penn, Capacity 2 1/2" Tube, 3 3/4" Solid 10"
Die Length, Hydraulic Feed, LATE

TESTING MACHINES

60,000, 100,000, 200,000 Olsen & Rehle Universal
50,000 and 300,000 lb Compression

TUBE MILL

Kina IK Welded Tube Mill, Cut-off & Transformer
Capy. 1/2" OD 0.28 wall to 2" OD .120 wall

WELDING POSITIONER

14,000± Cullen Friction Model #140, 220/440

WIRE DRAWING MACHINE

BB3-13 Synro Fine Wire Drawing Machine

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MOTOR GENERATOR SETS

Qu.	K.W.	R.P.M.	Make	Volts D.C.	Volts A.C.
1	1250	720	G.E.	600	2300/4160
1	1000	720	Whse.	600	2300/4160
1	500	1200	Whse.	125/250	2300/440
1	500	720	Cr. Wh.	575/600	2300
1	300	1200	Al. Ch.	250	2300
1	300	1200	G.E.	250	2300
1	300	1200	Cr. Wh.	250	2300
1	200	1200	Elliot	125	4000/2300
1	200	900	G.E.	250	2300
1	175	1200	G.E.	250	440/220
2	150	1200	Whse.	125	2300/440
2	150	1200	Reliance	125	2300/440
1	150	1200	G.E.	250	2300
1	100	1200	Whse.	125/250	440/220
1	100	1200	Al. Ch.	250	4000/2200

DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
1	1500	Whse.	Encl.	525	600
1	1000	G.E.	Mill	600	1500/300
1	1000	G.E.	MPC	550	80
1	675	Al. Ch.	Rev.	350	60
2	600	Al. Ch.	Mill	600	500/600
1	500	Whse.	Rev.	350	285/700
1	350	G.E.	CD 169A	230	1150
1	300	Whse.	Mill	230	300
2	275	Whse.	Mill	230	425/850
1	220/250	El. Dy.	Fed. Brg.	230	400/1200
1	180	G.E.	MPC	230	400
1	175	G.E.	CD 175A	230	850/1025
1	150	Whse.	SK 201	230	360/900
2	125	Whse.	SK 184	230	275/850
1	125	G.E.	MPC	230	400/800
1	100	El. Dy.	30 S	230	450/1350
1	80	Rel.	651 T	230	575/1150
2	75	Whse.	SK	230	250/1000
1	60/80	El. Dy.	25 S	230	525/1050
1	50	Whse.	SK 141	230	250/1000
1	35	Whse.	SK	230	250/1000
2	30/40	Whse.	SK 143	230	500/1500
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1	1500	G.E.	MT	6600	257
1	1100	F.M.	OYZE, B.B.	4800	1800
1	1000	A.C.	Mill	2300	240
1	800	G.E.	MT	2300	293
1	750	G.E.	MT-573	2200	1190
1	700	A.C.		2300	300
1	500	Whse.	CW	550	350
1	400	Whse.	CW-960A	440	1170
1	400	Whse.	CW	440	514
1	350	Whse.	CW-1213	2200	435
1	350	G.E.	IM-17A	440/2200	720
1	250	G.E.	MT-424Y	4000	257
1	250	G.E.	MT-559B	2200	1800
1	220	Al. Ch.		550	600
1	200	Cr. Wh.	30QB	440	505
1	200	G.E.	IM	440	435
1	200	G.E.	IM	2200	580
1	150 (unused)	Whse.	CW	425	435
2	125	A.C.		440	865
1	133	Al. Ch.		440	720
1	100	G.E.	IM-16	2200	435
1	100	G.E.	IM	440	600
4	100	A.C.	ANY	440	695

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1	800	G.E.	KT-573	2200	1180
2	650	G.E.	KT-559BY	440	3570
2	450	Whse.	CR-1420	2300/4150	354
1	400	G.E.	IK	2200	500
1	200	G.E.	IK-17	440	580
2	200	G.E.	KT-557	440	1800
1	150/75	G.E.	IK	440/800	450
1	150	Whse.	CR-558	440	580
2	125	Al. Ch.	ARW	2200	1750

SYNCHRONOUS

Qu.	H.P.	Make	Type	Volts	RPM
1	7000	G.E.	ATI	2200/6600	600
1	4350	C.W.	3501SL4000/6900/13800	514	
1	2850	Whse.	.8 p.f.	2300/4600	514
1	2500	Whse.	.8 p.f.	2300	720
2	2000	Whse.		2300	1200
2	1750	G.E.	ATI	2200	3000
1	735	G.E.	ATI	2200/12000	600
1	500	G.E.	TS-7567	2200	1200
1	450	Whse.		2300	125.5
1	325	G.E.	ATI	440	1800
1	225	G.E.	ATI	440	1800

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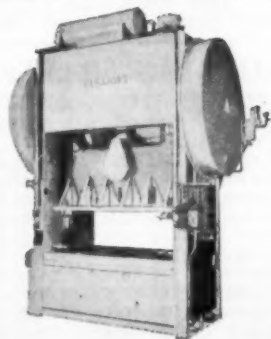
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All Sizes in Stock
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COMBUSTION OR INSTRUMENT TECHNICIAN for supervisory position in small integrated steel plant. Open Hearth and Heating Furnace experience preferred. Please state age, experience and qualifications in reply. Address Box G-455, care The Iron Age, Chestnut & 56th Sts., Philadelphia 39.

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Old established company seeks man thoroughly experienced in all departments. Knowledge of secondary steel essential. Salary Plus. Opportunity for aggressive man. All replies confidential.

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Have something new on the market or do you just want to tell why your product does the job better. Either way your advertisement in The Iron Age carries more weight and reaches more prospects. Over 800 advertisers will sell through these pages in The Iron Age this year.

METALWORKING BRIEFS

Seaway Half Completed; More Bids Open

The St. Lawrence Seaway project, under construction for two years, has reached the half-way mark. Remaining to be let are contracts for the Richards Point dike, several smaller dikes, water and sewer lines in Waddington, N. Y., two bridges near Waddington, relocation of the Norwood-St. Lawrence Railroad, erection of docks and electrical power lines plus other construction jobs.

Rosy First Quarter Predicted By P. A.'s

The business climate for the remainder of 1956 and into the first quarter of 1957 is expected to be "good to excellent," results of the November poll by the National Assn. of Purchasing Agents show. There is strong feeling that some recent price increases were based on the get-all-you-can policy, rather than on increased costs the P.A.'s believe.

Blast Furnace Down For Repairs

U. S. Steel Corp. reports it has taken one blast furnace out of production in the Pittsburgh district for partial relining. The furnace, which produces 11,084 tons of pig iron a day, will be out about a month.

New Canadian Tube Mill Coming

A \$5 million pipe mill is planned by Page-Hersey Tubes Ltd., Toronto, at Welland, Ont. It will produce electric-resistance weld steel pipe. Completion is expected in 1958.

50 Pct More Steel By 1972?

The nation's steel needs may call for an additional annual ingot capacity of 70 million tons in the next 15 years, according to A. B. Homer, president of Bethlehem Steel Co., in an address before the Investment Bankers Assn. convention at Hollywood Beach, Fla.

Jeweled Watch Probe Date Is Set

The U. S. jeweled watch industry gets a chance on Jan. 7 to tell the government why it thinks Swiss watch imports should be restricted. Defense officials want the domestic industry protected as a reserve against being cut off from Switzerland in an emergency. Charles H. Kendall, ODM's general counsel, will conduct the hearings.

Improvements By U.S. Steel To Aid Plate Users

U. S. Steel's big plant improvement program, which will add over 1.3 million ingot tons to the Chicago district's output, has begun. Contracts are being placed and work probably will get underway early in 1957. Plates and structurals will share the bulk of the increase, company officials say. Improvements will be made to openhearth shops at Gary works and South works and a new slabbing mill is planned for Gary works.

ADVERTISERS

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\$18.50

List Price*

*\$18.50 is the list price for the 1/4" port size and \$19.50 for the 3/8" less usual quantity discounts.



250 P.S.I.

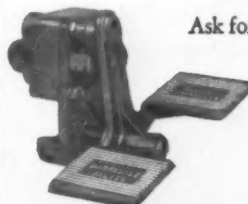
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for Air and Cost-Minded

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Important Savings	Low initial cost. Need no oilers and filters (time and materials savings).	All components are corrosion resistant.
Low Maintenance	Sealing qualities do not diminish with long, continued use.	Wear compensating "Shear-Seal" design.
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The theme of the 1957 IRON AGE Annual Issue

JANUARY 3

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Production and Price Data, Trade Association Directory, and other reference-value features essential to metalworking management planning

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One foundry says it "cuts labor costs." Another says it "reduces maintenance." A third says, "speeds production." Foundries that blast clean with Pangborn Rotoblast equipment can offer different reasons—and combinations of them—for Rotoblast's cost-cutting operation.

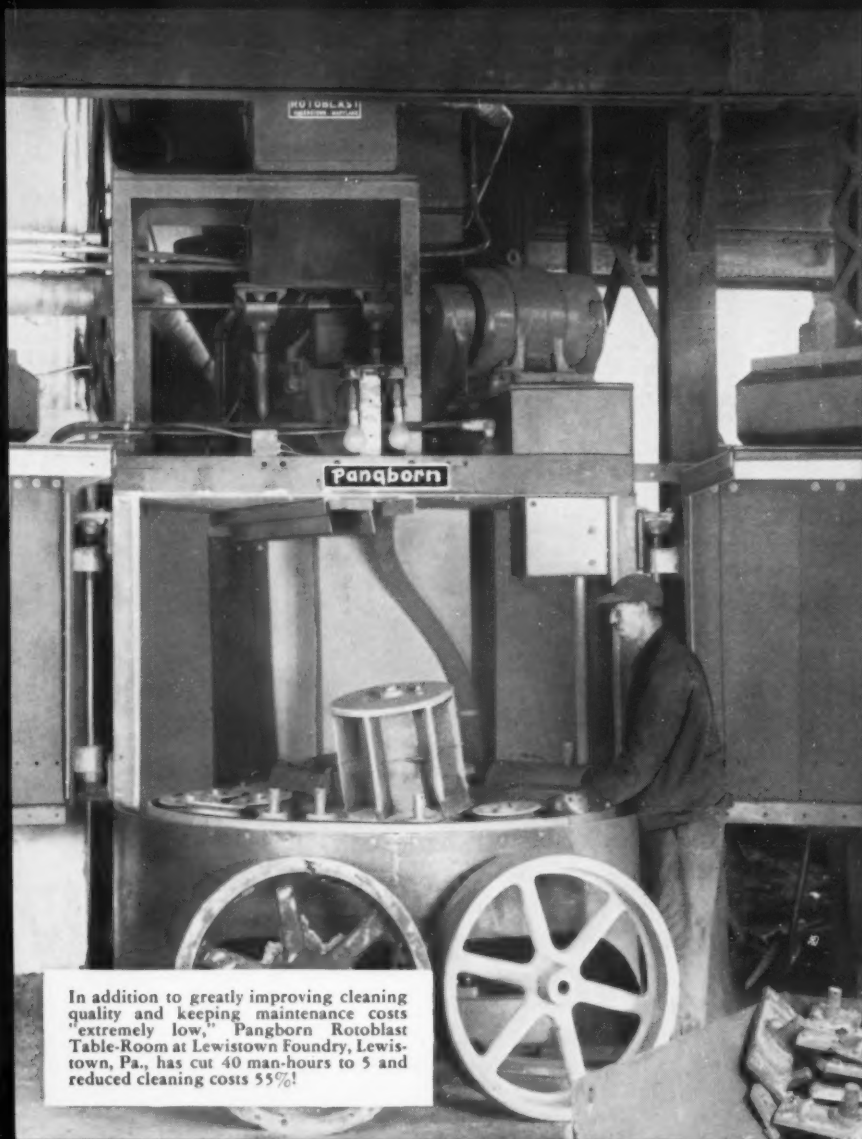
They all add up to one thing—*lowest cost per ton of castings cleaned!* That's because Pangborn Rotoblast cleans thoroughly, quickly, automatically. You get a finer, uniform finish on your jobs; power and labor costs go down; maintenance costs drop; production goes up.

Check your present cost per ton and then find out how Pangborn can *slash* your cleaning costs. Write for Bulletin 227 to PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md. *Manufacturers of Blast Cleaning and Dust Control Equipment.*

And cuts labor costs in half at Keen!



Pangborn Rotoblast Table and Rotoblast Barrel at Keen Foundry, Griffith, Ind., clean *three times faster* than previous equipment, cut cleaning room labor costs 50%!



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Pangborn BLAST CLEANS CHEAPER



Rotoblast Barrels—
A Continuous-Flow Barrel



Rotoblast Tables
& Table-Rooms

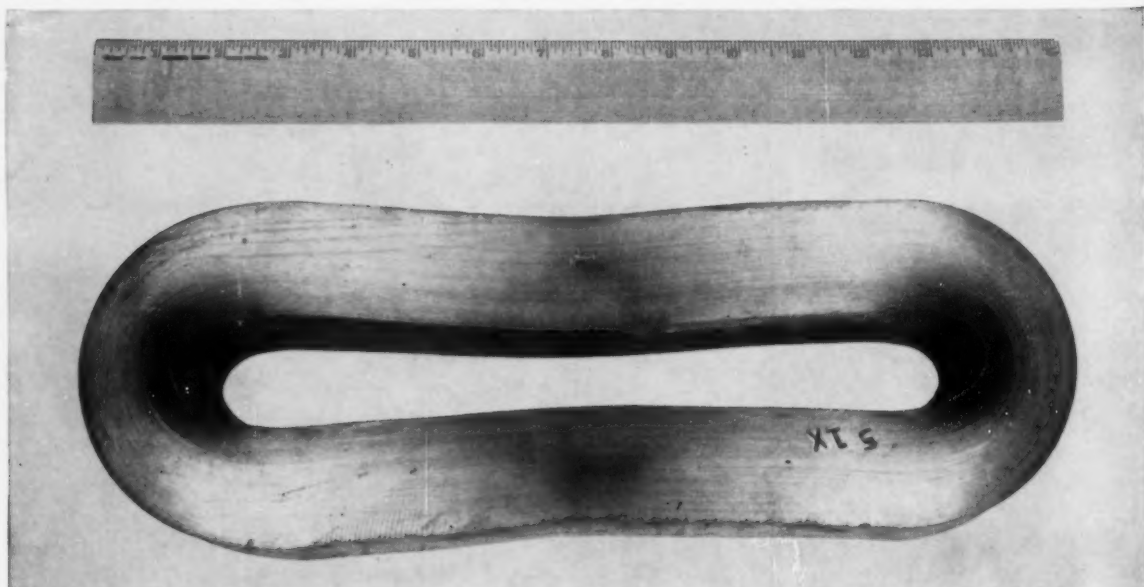


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& Cabinets



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To get the best possible tube life per dollar: Ask the experts!

This month's report is on:

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Carbon	Sicromo 2	Sicromo 5S	18-8 Ti
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Silmo	Sicromo 3	Sicromo 9M	25-12*
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* Available as seamless tubing on an experimental basis only.

**Not available as seamless tubing.

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